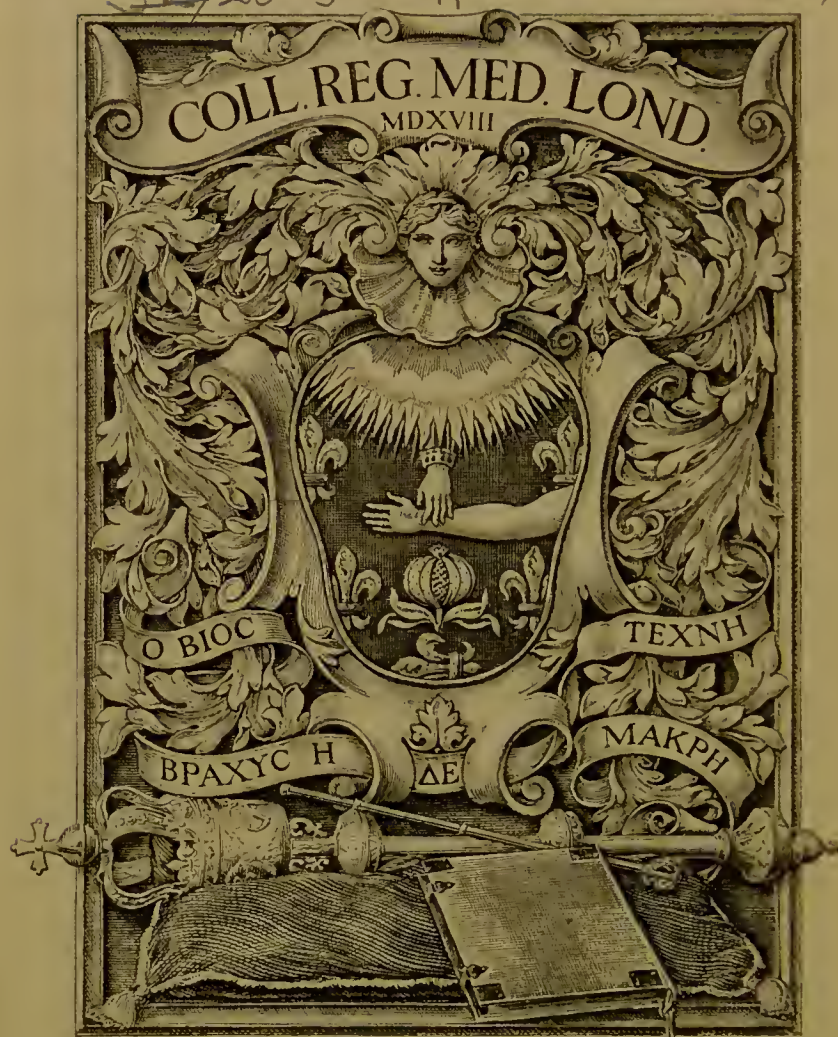


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THE
PHARMACOPŒIA
OF THE
UNITED STATES OF AMERICA
SEVENTH DECENNIAL REVISION
(1890)

BY AUTHORITY OF THE
NATIONAL CONVENTION FOR REVISING THE PHARMACOPŒIA
HELD AT WASHINGTON, A.D. 1890

OFFICIAL FROM JANUARY 1st, 1894

PUBLISHED BY THE COMMITTEE OF REVISION

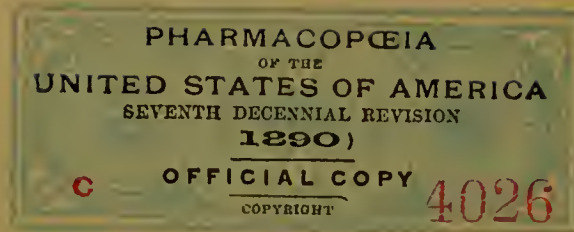
PHILADELPHIA

PRINTERS AND BINDERS: J. B. LIPPINCOTT COMPANY

AGENTS: P. BLAKISTON, SON & COMPANY

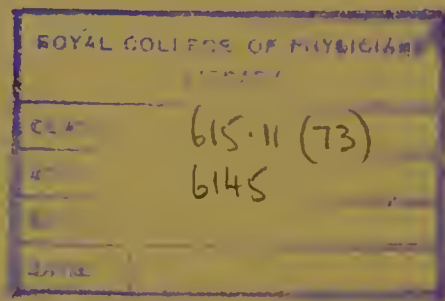
1893





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CHARLES RICE, JOSEPH P. REMINGTON, C. LEWIS DIEHL, ROBERT T. EDES, JAMES M. FLINT,
Publication Committee
of the
Committee of Revision and Publication of the Pharmacopœia of the United States of America,
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HISTORICAL INTRODUCTION.

IN January, 1817, Dr. Lyman Spalding,* of New York City, submitted to the Medical Society of the County of New York a project for the formation of a National Pharmacopœia.†

Dr. Spalding's plan was as follows: The United States were to be divided into four districts—Northern, Middle, Southern, and Western; the New England States to form the Northern District; New York, New Jersey, Pennsylvania, Delaware, Maryland, and the District of Columbia, the Middle District; and the States south and west of these borders to constitute the other two districts.

The plan provided that a Convention should be called in each of these districts, to be composed of delegates from all the medical

* Born at Cornish, N.H., June 5, 1775; died at Portsmouth, N.H., October 30, 1821.

† While European Pharmacopœias were chiefly relied upon as authorities previous to the appearance of the first official Pharmacopœia of the United States of America, yet a few works had appeared, previous to this time, which deserve to be recorded here.

In 1778 there was published at Philadelphia a small Pharmacopœia for the use of the Military Hospital of the U.S. Army located at Lititz, Lancaster Co., Pennsylvania, under the title: "*Pharmacopœia simpliciorum et efficaciorum, in usum nosocomii militaris, ad exercitum foederatarum Americæ civitatum pertinentis; hodiernæ nostræ inopiæ rerumque angustiis, feroci hostium sævitiae, belloque crudeli ex inopinato patriæ nostræ illato debitis, maxime accommodata.*" A second edition of this appeared in 1781, on the title-page of which Dr. William Brown is mentioned as author.

On October 3, 1805, the Counsellors of the Massachusetts Medical Society appointed a Committee to draft a Pharmacopœia adapted to the special wants of their section of this country. The Committee, consisting of Dr. James Jackson and Dr. John C. Warren, endeavored to secure the co-operation of medical institutions in other States, with the object of making the work national, but without success. They presented the result of their labors to the Counsellors on June 5, 1807, and the work was issued some time in the early part of 1808. It was based upon the last preceding edition of the Edinburgh Pharmacopœia, but contained much original matter, among which was a posological and prosodial table.

In 1815 the Physicians and Surgeons of the New York Hospital appointed Dr. Samuel L. Mitchill and Dr. Valentine Seaman a Committee to prepare a Pharmacopœia for the use of that institution. This was issued in 1816, and enjoyed for some years an authority of more than local character.

societies and schools situated within each of them. Each District Convention was to form a Pharmacopœia, and appoint delegates to a General Convention, to be held in Washington. To this General Convention the four District Pharmacopœias should be taken, and from the material thus brought together a National Pharmacopœia should be compiled. Dr. Spalding's plan was approved by the committee to which it was referred, and subsequently, through the agency of the Medical Society of the State of New York, was carried into effect. This society issued circulars requesting the co-operation of the several incorporated State Medical Societies, the several incorporated Colleges of Physicians and Surgeons, or Medical Schools, or such medical bodies as constituted a faculty in any incorporated university or college in the United States; and in any State or Territory in which there was no incorporated medical society, college, or school, voluntary associations of physicians and surgeons were invited to assist in the undertaking.

The following organizations approved the plan of forming a National Pharmacopœia and appointed delegates to district conventions: Massachusetts Medical Society, June 2, 1818; College of Physicians and Surgeons in the City of New York, June 25, 1818; Medical and Chirurgical Faculty of Maryland, June, 1818; Rhode Island Medical Society, September 1, 1818; Medical Society of South Carolina, September, 1818; Medical Society of the District of Columbia, October 5, 1818; Connecticut Medical Society, October 15, 1818; Medical Institution of Yale College, October 28, 1818; Vermont Medical Society, October, 1818; Board of Physicians and Surgeons of the First Medical District of the State of Indiana, November 3, 1818; College of Physicians and Surgeons of the Western District of the State of New York, January, 1819; College of Physicians of Philadelphia, February 2, 1819; Medical Faculty of Brown University, March 15, 1819; Medical School at Lexington, Ky., April, 1819; New Hampshire Medical Society, May 5, 1819; Medical Society of New Jersey, May 11, 1819; Medical Society of the State of Delaware, May, 1819; Medical Society of Georgia, May, 1819.

The Medical College of Ohio and the Medical Society of New Orleans approved the formation of a National Pharmacopœia, but did not appoint delegates.

The District Convention for the New England States was held in Boston, June 1, 1819, and a District Pharmacopœia was adopted.

The District Convention of the Middle States was held in Philadelphia, June 1, 1819, and two outlines of Pharmacopœias, submitted by the delegates from New York and Philadelphia, were, by a committee

there chosen, formed into one, which was adopted as the Pharmacopœia of the Middle District.

There were no conventions held in the Southern and Western Districts, but measures were taken, by those concerned, to secure a representation of the Southern District in the General Convention at Washington. The General Convention for the formation of a National Pharmacopœia assembled in the Capitol, at Washington, January 1, 1820, and elected Samuel L. Mitchill, M.D., President, and Thomas T. Hewson, M.D., Secretary.

The two Pharmacopœias prepared in the Northern and Middle Districts were submitted to examination, compared in detail, and their contents, with such additions as were thought necessary, consolidated into one work, which, after full revision, was adopted by the General Convention, and ordered to be published by a committee appointed for that purpose, of which Dr. Lyman Spalding was chairman. It was published in Boston, December 15, 1820, in both the Latin and English languages, a second edition appearing in 1828.

Before adjourning, the General Convention of 1820 made arrangements for the future revision of the work. It instructed its President to issue, on January 1, 1828, writs of election to the several incorporated State Medical Societies and incorporated Medical Colleges and Schools in the Northern District, requiring them to ballot for three delegates to a General Convention to be held at Washington on January 1, 1830, for the purpose of revising the American Pharmacopœia; and that these several institutions be requested to forward to the President, on or before April 1, 1829, the names of three persons thus designated by ballot; and the President of the Convention was requested, on the said day, to assort and count the said votes, and to notify the three persons, who should have the greatest number of votes, of their election; and, in case there should not be three persons who had a greater number of votes than others, then the said President was desired to put a ballot into the box for each of those persons who had an equal number of votes, and draw therefrom such number of ballots as should make the number of delegates three, and notify as before directed.

This resolution was to apply in like manner to the Middle, Southern, and Western Districts.

Accordingly, there were to be three delegates from each of the four districts, the Convention thus to consist of twelve delegates.

Notwithstanding the care thus exercised by the Convention of 1820 to arrange for a Convention in 1830, a serious misunderstanding

occurred, the result of which was that two Pharmacopœias were published in 1830—one in New York and one in Philadelphia.

The President issued, on January 1, 1828, writs of election, as instructed by the Convention of 1820 ; but, on account of a certain ambiguity of expression in the resolution of the Convention of 1820, and perhaps, also, in the communication of President Mitchill addressed to the various societies and colleges, some of the organizations did not correctly understand what was expected of them, and instead of sending to President Mitchill the state of the ballot, sent to him merely its result. It appears to have been the impression in many places that the societies addressed were to choose delegates, and that the delegates thus chosen were to proceed to Washington.

President Mitchill received returns from the Northern and Middle Districts, but none from the Southern and Western Districts. He counted the ballots returned to him, as he understood that they should be counted, and notified the three chosen by each of the two districts of their election, but the appointment of the delegates for the Middle District was not satisfactory to many of the medical societies of that region.

The delegates from the Northern and Middle Districts who had been notified by President Mitchill of their election, resolved, by general concurrence, and for the sake of convenience, to hold the meeting of the Convention at New York instead of at Washington, as directed by the authority under which they were chosen. Eli Ives, M.D., of Yale College, Connecticut, was elected President. As they were so few in number, they adjourned for six months in order to obtain assistance from the medical fraternity of the country. They issued a circular to each of the Medical Societies and Medical Institutions in the United States not represented in the Convention, requesting them to appoint a delegate to co-operate with this Convention in revising the American Pharmacopœia ; and, provided no delegate should be appointed, or, if appointed, be unable to attend, said society or medical institution or delegates were requested to communicate their ideas, in relation to the revision of the Pharmacopœia, to the Convention at their next session to be held on the first Wednesday of June, 1830, at the College of Physicians and Surgeons of New York.

The Convention met, according to agreement, in New York, June 2, 1830, ten delegates being present, representing : Connecticut, South Carolina, New York, Ohio, and Western Massachusetts. They revised the Pharmacopœia of 1820, authorized the publication of their revision, and, before adjourning, provided for a subsequent revision in 1835. The book was published in New York, November, 1830.

In consequence of the dissatisfaction existing in the Middle District, arrangements were made to hold a Convention at Washington, January, 1830, which should be more fairly representative of the medical societies, colleges, and schools of the Middle District.

The Convention was held in the Capitol, at Washington, January 4, 1830. It consisted of eight delegates, two from New Jersey, two from Philadelphia, one from Delaware, one from Maryland, and two from the District of Columbia, all members from the Middle District. Lewis Condict, M.D., of New Jersey, was elected President.

Since many sections of the United States were not represented at this Convention, and it appeared desirable that the various medical interests of the country should have their due representation, it was resolved, soon after the organization of the Convention, that the Surgeon-General of the Army, the senior surgeon of the Navy, stationed at Washington, and those Members of Congress who were practitioners of medicine, should be invited to participate in the proceedings.

In compliance with this invitation, the Surgeon-General of the Army, the senior surgeon of the Navy, and three Members of Congress took their seats in the Convention, thus increasing the number of the delegates to thirteen. The Convention appointed a Committee of Revision, consisting of a Chairman and two members from each of the following cities, viz.: Boston, New York, Philadelphia, Baltimore, Washington, Charleston, Lexington, and Cincinnati.

The Chairman of the Committee was requested to open a correspondence with the several members for the purpose of submitting to their examination a revised draft of the Pharmacopœia presented to the Convention by the delegates from Pennsylvania. He was also instructed to call a meeting of the Committee in Philadelphia. Any three members were constituted a quorum for the transaction of business, and, after a careful examination of the several communications that might be submitted to them, they were to prepare a revised edition of the Pharmacopœia, and make the necessary arrangements for its publication.

The Committee performed the duty imposed upon them, and their revision of the Pharmacopœia was published in Philadelphia in 1831.

Previous to adjournment, the Convention arranged for a Convention in 1840, by the following resolution: "*Resolved*, That the President of this Convention shall, on the first day of January, 1839, issue a notice, requesting the different incorporated State Medical Societies, the incorporated Medical Colleges, and the incorporated Colleges of Physicians and Surgeons, throughout the United States, to elect a number

of delegates, not exceeding three, to attend a General Convention to be held at Washington, D.C., on the first Monday in January, 1840."

The plan of the New York Convention for a revision of the Pharmacopœia in 1835 was subsequently abandoned. The plan of the Washington Convention for a revision in 1840 was quite generally recognized as the more feasible, and was fully carried out.

The notices for the choice of delegates to the Convention of 1840 were issued by Lewis Conduct, M.D., President of the Washington Convention of 1830, in accordance with the resolution quoted above. The Convention assembled at Washington on the first day of January, 1840, twenty delegates being present, representing the Rhode Island Medical Society, the New Jersey Medical Society, the College of Physicians of Philadelphia, the University of Pennsylvania, the Jefferson Medical College of Philadelphia, the Delaware Medical Society, the Washington University of Baltimore, the Medical and Chirurgical Faculty of Maryland, the Medical Society of the District of Columbia, the Columbian Medical College, the Vincennes Medical Society of Indiana, and the Medical Society of Georgia.

The credentials of delegates from the Medical Society of Vermont, the Medical Society of New Hampshire, the Albany Medical College, and the College of Physicians and Surgeons of Lexington, Kentucky, were presented, but the delegates did not make their appearance during the session. Lewis Conduct, M.D., of New Jersey, was elected President.

With the view of giving the various medical interests of the country proper representation in the Convention, the Surgeon-General of the Army and the senior surgeon of the Navy stationed at Washington were invited to participate in the proceedings. The Convention appointed a Committee of Revision and Publication, consisting of seven members, three to form a quorum, and the meetings of the Committee to be held at Philadelphia. To this Committee were referred all communications received by the Convention from the various organizations represented. The Committee was authorized to request the co-operation of the colleges of pharmacy in the United States, and to publish the work after the completion of the revision. Valuable assistance was rendered the Committee by the Colleges of Pharmacy of Boston, New York, and Philadelphia, especially by the latter. The book was not published until early in the year 1842. In this revision the Latin version was omitted. The process of displacement or percolation was introduced for the first time.

Before adjourning, provision was made, by the following resolution, for a Convention in 1850 :

“The President of this Convention shall, on the first day of May, 1849, issue a notice, requesting the several incorporated State Medical Societies, the incorporated Medical Colleges, the incorporated Colleges of Physicians and Surgeons, and the incorporated Colleges of Pharmacy, throughout the United States, to elect a number of delegates, not exceeding three, to attend a General Convention to be held at Washington, on the first Monday in May, 1850.”

In accordance with this resolution, the Convention met at Washington, May 6, 1850, thirty delegates being present, representing: the Rhode Island Medical Society, the Geneva Medical College, the College of Pharmacy of the City of New York, the Medical Society of New Jersey, the College of Physicians of Philadelphia, the University of Pennsylvania, the Jefferson Medical College of Philadelphia, the Medical Faculty of the Pennsylvania College, the Medico-Chirurgical College of Philadelphia, the Philadelphia College of Pharmacy, the Medical Society of Delaware, the Medical and Chirurgical Faculty of Maryland, the Medical Society of the District of Columbia, the National Medical College of the District of Columbia, the Medical Department of the National Institute, the Georgetown Medical College, and the Rush Medical College of Chicago.

The credentials of delegates from the New Hampshire Medical Institution, the University of Buffalo, the Medical Department of Hampden-Sidney College, the Medical Society of South Carolina, the Medical College of Ohio, the Cincinnati College of Pharmacy, the Missouri Medical Society, the Wisconsin State Medical Society, and the Medical Faculty of the University of Iowa were presented, but the delegates did not make their appearance during the session.

George B. Wood, M.D., of Philadelphia, was chosen President. The Surgeon-General of the Army and the Chief of the Bureau of Medicine and Surgery of the Navy Department were invited to participate in the proceedings.

The Convention appointed a Committee of Revision and Publication, consisting of the President of the Convention and three other members, three of whom should form a quorum; the meetings of the Committee to be in Philadelphia, and the Committee to publish the work after its revision.

The book was published in 1851, and a second edition in 1855. Before adjourning, the Convention of 1850 made arrangements for a Convention to be held on the first Wednesday in May, 1860, by a resolution similar to the one adopted by the Convention of 1840.

The Convention met in 1860, thirty delegates being present, representing: the Maine Medical Association, the Massachusetts Medical

Society, the Massachusetts College of Pharmacy, the Connecticut State Medical Society, the Medical Society of the State of New York, the New York Academy of Medicine, the College of Pharmacy of the City of New York, the University of Pennsylvania, the Jefferson Medical College of Philadelphia, the College of Physicians of Philadelphia, the Philadelphia College of Pharmacy, the Delaware State Medical Society, the University of Maryland, the Maryland College of Pharmacy, the National Medical College of Washington, the Medical Society of the District of Columbia, the United States Army, and the United States Navy. George B. Wood, M.D., of Philadelphia, was chosen President.

A Committee of Revision and Publication was appointed, consisting of nine members, including the President of the Convention. To this Committee were referred all communications relating to the revision of the Pharmacopœia. Three members were to form a quorum. The Committee was to meet in Philadelphia, and was authorized to publish the work after its revision. The book was published in June, 1863. Before adjourning, the Convention made arrangements, by a resolution similar to that adopted by the Convention of 1850, for a Convention in 1870.

In accordance with this resolution, a Convention met in Washington, Wednesday, May 4, 1870, sixty delegates being present, representing: the St. Louis Medical College, the Maryland College of Pharmacy, the Missouri Medical College, the St. Louis College of Pharmacy, the Chicago College of Pharmacy, the Jefferson Medical College, the Medical Society of the District of Columbia, the Medical College of Virginia, the Massachusetts College of Pharmacy, the Medical Society of the State of New York, the College of Physicians of Philadelphia, the College of Pharmacy of the City of New York, the National Medical College of Washington, the University of Pennsylvania, the Philadelphia College of Pharmacy, the College of Pharmacy of Baldwin University, the Medico-Chirurgical Society of Louisville, the Baltimore Medical Association, the Medical Department of Georgetown College, the Washington University of Baltimore, the Massachusetts Medical Society, the Maine Medical Association, the University of Buffalo, the Medical and Chirurgical Society of Maryland, the Baltimore Medical Association, the University of Nashville, the University of Maryland, the Pharmaceutical College of Howard University, the University of Virginia, and the Woman's Medical College of Philadelphia.

Such Members of Congress as were graduates of regular medical schools, the Surgeon-General of the Army, and the Chief of the Bureau of Medicine and Surgery of the Navy Department, were in-

vited to take seats in the Convention and participate in its deliberations. Joseph Carson, M.D., of Philadelphia, was elected President of the Convention.

A Committee of Revision and Publication, consisting of fifteen members, was appointed and given definite instructions as to the general plan to be followed in revising the Pharmacopœia.

Before adjourning, it was resolved that the rules adopted by the Convention of 1860, for the meeting of 1870, be adopted for the Convention of 1880, simply changing the dates.

The fifth revision of the Pharmacopœia was published in 1873.

The next Convention assembled on May 5, 1880, at Washington. There were one hundred and nine delegates accredited from ten Medical Societies, twenty-three Medical Colleges, eleven Pharmaceutical Colleges, and the medical departments of the Army, the Navy, and the Marine Hospital Service. Seventy-five delegates attended the meeting. Dr. Robert Amory, of Boston, was elected President of the Convention.

Important changes were directed at this meeting to be made in the Pharmacopœia, the more prominent ones being the following: all articles were to be arranged in alphabetical order; the new chemical nomenclature was to be introduced; quantities were to be stated in "parts by weight," and descriptions of crude drugs and of chemicals were to be made more comprehensive and exact. Numerous tables were also directed to be added to the work. A Committee of Revision was elected, consisting of twenty-five members, and its powers and duties were expressly defined.

Regarding the call to be issued for the Convention of 1890, it was resolved that the President of the Convention of 1880 should, on or about the first day of May, 1889, issue a notice requesting the several incorporated Medical Societies, the incorporated Medical Colleges, the incorporated Colleges of Pharmacy, and the incorporated Pharmaceutical Societies throughout the United States, and the American Medical Association and the American Pharmaceutical Association, to elect a number of delegates, not exceeding three, and the Surgeon-General of the Army, the Surgeon-General of the Navy, and the Surgeon-General of the Marine Hospital Service, to appoint, each, not exceeding three medical officers, to attend a General Convention for the Revision of the Pharmacopœia of the United States, to be held in Washington, D.C., on the first Wednesday of May, 1890.

It was also resolved that the several bodies, as well as the Medical Departments of the Army, the Navy, and the Marine Hospital Service, thus addressed, should also be requested by the President to submit

the Pharmacopœia to a careful revision and to transmit the result of their labors, through their delegates, to the Committee of Revision, at least three months before the meeting of the Convention.

The several medical and pharmaceutival bodies were further to be requested to transmit to the President of the Convention of 1880 the names and residences of their respective delegates, as soon as they had been appointed; a list of whom was to be published, under his authority, for the information of the medical public, in the newspapers and medical journals, in the month of March, 1890.

Finally, it was resolved that in the event of the death, resignation, or inability of the President of the Convention to act, these duties should devolve, successively, in the following order of precedence: upon the Vice-Presidents, the Secretary, the Assistant Secretary, and the Chairman of the Committee of Revision and Publication of the Pharmacopœia.

The sixth revision of the Pharmacopœia was published at the close of October, 1882.

ABSTRACT OF THE PROCEEDINGS

OF THE

NATIONAL CONVENTION OF 1890

FOR

REVISING THE PHARMACOPOEIA.

SEVENTH DECENNIAL CONVENTION.

IN accordance with the call of Dr. Robert Amory, the President of the Convention of 1880, the Convention for the Seventh Decennial Revision of the Pharmacopœia of the United States of America met in the law lecture-room of the Columbian University, in the City of Washington, D.C., on the 7th of May, 1890, at 12 M., and immediately appointed a Committee on Credentials, consisting of George L. Magruder, M.D., of Washington; H. M. Field, M.D., of Hanover, N.H.; B. F. Davenport, M.D., of Boston; G. W. Sloan, M.D., of Indianapolis; G. F. H. Markoe, Ph.G., of Boston; A. E. Ebert, of Chicago; and W. M. Mew, M.D., of the U. S. Army.

The following delegates were admitted to seats, either at once, or during the several sessions of the Convention.

LIST OF DELEGATES ACCREDITED TO THE PHARMACOPŒIAL CONVENTION OF 1890.

ALABAMA.

Alabama Pharmaceutical Association.—*Philip C. Candidus, *M. E. Withington, *E. H. Cross.

ARKANSAS.

Arkansas State University, Medical Department.—John B. Bond, M.D.
Arkansas Association of Pharmacists.—W. W. Kerr.

NOTE.—Alternates are mentioned only if they were present. An asterisk in front of a name indicates that the delegate was absent.

CALIFORNIA.

Medical Society of the State of California.—A. L. Lengfeld, M.D.
California Pharmaceutical Society and College of Pharmacy.—*Emlen
 Painter, Ph.G., W. M. Searby, *W. T. Wenzell, Ph.G.,
 Ph.M. Alternate, R. G. Eceles, M.D.

COLORADO.

Denver College of Pharmacy (Department of Pharmacy of the University of Denver).—*Charles M. Ford, Ph.G., *J. A. Sewell, M.D., LL.D., *John Koehan, Ph.G.

CONNECTICUT.

Connecticut Medical Society.—C. A. Lindsley, M.D., F. J. Young, M.D., *O. J. D. Hughes, M.D.
Yale College, Medical Department.—*Thomas H. Russell, M.D.
Connecticut Pharmaceutical Association.—Warren A. Spaulding, Charles A. Rapelye, Edward T. Vanece.

DELAWARE.

The Medical Society of Delaware.—F. E. Stewart, M.D., *E. W. Cooper, M.D., *D. L. Mustard, M.D.
Delaware Pharmaceutical Society.—Jacob S. Beetem, Ph.G., Frank Roop Smith, Ph.G., William Poole, Ph.G.

DISTRICT OF COLUMBIA.

Medical Society of the District of Columbia.—Samuel C. Busey, M.D., Robert T. Edes, M.D., Henry D. Fry, M.D.
National University, Medical Department.—John T. Winter, M.D., Samuel S. Adams, M.D., Louis Kolipinski, M.D. Alternates, G. Wythe Cook, M.D., Geo. W. West, M.D., J. B. Hodgkin, D.D.S.
Howard University, Medical and Pharmaceutical Department.—W. H. Seaman, M.D., *John E. Brackett, M.D., Clarence R. Dufour, M.D. Alternates, Thos. B. Hood, M.D., Robert Reyburn, M.D.
University of Georgetown, Medical Department.—C. H. A. Kleinschmidt, M.D., G. L. Magruder, M.D., J. J. Stafford, M.D.
National Medical College, Medical Department of Columbian University.—D. W. Prentiss, M.D., *E. T. Fristoe, A.M., LL.D., *W. W. Johnston, M.D.
National College of Pharmacy (Washington).—W. S. Thompson, J. R. Walton, Phar.D., M.D., H. E. Kalusowski, Phar.D., M.D.

GEORGIA.

Georgia Pharmaceutical Association.—George F. Payne, Ph.G., M.D., *H. R. Slack, Jr., Ph.G., M.D., *R. H. Land, Ph.G.

ILLINOIS.

Rush Medical College (Chicago).—James H. Etheridge, M.D.,
* Walter S. Haines, M.D.

Chicago College of Pharmacy.—C. S. N. Hallberg, Ph.G., Richard
C. Frerksen, Ph.G., George M. Hambright, Ph.G.

Illinois College of Pharmacy.—Oscar Oldberg, Phar.D., * W. E.
Quine, M.D., William Bodemann. *Alternate*, T. H. Patterson,
M.D.

Illinois Pharmaceutical Association.—* Charles W. Day, * F. C.
Bourscheidt, * H. Biroth. *Alternates*, T. H. Patterson, M.D.,
George C. Lescher, Ph.G.

INDIANA.

Indiana State Medical Society.—George W. Sloan, Phar.D., M.D.

Central College of Physicians and Surgeons (Indianapolis).—* S. E.
Earp, M.Sc., M.D., * J. B. Long, M.D., * G. W. Vernon,
M.D.

Indiana Pharmaceutical Association.—* Leo Eliel, * John N. Hurty,
Phar.D., M.D., * W. C. Buntin, Ph.G.

Purdue University, School of Pharmacy.—* Arthur L. Green, A.M.,
Ph.C., * George Spitzer, Ph.G., * E. G. Eberhardt, Ph.G.

IOWA.

Iowa State Medical Society.—* Rosa Upson, M.D.

Iowa State Pharmaceutical Association.—George H. Schafer, J. H.
Harrison, Emil L. Boerner, Ph.G.

State University of Iowa, Department of Pharmacy.—Emil L. Boerner,
Ph.G., * P. J. Farnsworth, * Launcelot Andrews.

KANSAS.

Kansas Pharmaceutical Association.—L. E. Sayre, Ph.G., * George
Leis, Robert J. Brown.

University of Kansas, School of Pharmacy.—* E. H. S. Bailey, Ph.D.,
* C. L. Becker, Ph.C., * John T. Moore, M.D. *Alternate*, Mrs.
M. O. Miner, Ph.G.

KENTUCKY.

Kentucky State Medical Society.—* William Bailey, M.D., * J. A.
Larrabee, M.D., * Henry Orendorf, M.D.

Kentucky Pharmaceutical Association.—C. Lewis Diehl, Ph.M., W.
S. Johnson, * George A. Zwick.

Louisville College of Pharmacy.—C. Lewis Diehl, Ph.M., * Edward
Goebel, B. Buckle, M.D.

Louisville School of Pharmacy for Woman.—* J. P. Barnum, M.D.,
* Wiley Rogers, Ph.D., M.D., * T. Hunt Stucky, Ph.D.,
M.D.

LOUISIANA.

Louisiana State Pharmaceutical Association.—* Charles L. Keppler, Robert N. Girling, * A. L. Lagarde.

MARYLAND.

Medical and Chirurgical Faculty of the State of Maryland.—Eugene F. Cordell, M.D., J. Edmondson Atkinson, M.D., T. Barton Brune, M.D.

College of Physicians and Surgeons (of Baltimore).—* R. Gundry, M.D., W. Simon, M.D., * G. H. Rohé, M.D.

Baltimore Medical College.—* J. Webb Foster, Ph.G., * R. H. P. Ellis, M.D., * John D. Blake, M.D.

University of Maryland, Faculty of Physic.—* F. E. Atkinson, M.D.
Woman's Medical College of Baltimore.—Amanda Taylor Norris, M.D.

Maryland State Pharmaceutical Association.—William Simon, Ph.D., M.D., John F. Hancock, J. Fuller Frames.

Maryland College of Pharmacy.—Louis Dohme, Ph.G., W. S. Thompson, * N. H. Jennings. *Alternate*, D. M. R. Culbreth.

MASSACHUSETTS.

Massachusetts Medical Society.—Bennett F. Davenport, M.D., * Francis H. Williams, M.D., * Charles Harrington, M.D. *Alternate*, Robert Amory, M.D.

Harvard University, Harvard Medical School.—* Charles Harrington, M.D., * Francis H. Williams, M.D.

Massachusetts State Pharmaceutical Association.—George F. H. Markoe, Ph.G., C. P. Pengra, Ph.C., M.D., J. H. Manning.

Massachusetts College of Pharmacy.—* Samuel A. D. Sheppard, Ph.G., Edgar L. Patch, Ph.G., * Charles C. Williams, Ph.G., M.D. *Alternates*, W. W. Bartlet, Ph.G., G. R. Tucker, Ph.G., S. B.

MICHIGAN.

University of Michigan, Department of Medicine and Surgery.—* H. F. Lyster, A.M., M.D., H. M. Hurd, A.M., M.D., * Paul C. Freer, Ph.D., M.D. *Alternates*, Ransom H. Stevens, Ph.C., M.D., Byron F. Dawson, Ph.C., M.D.

University of Michigan, School of Pharmacy.—A. B. Prescott, M.D., O. C. Johnson, A.M., Ph.C., A. B. Stevens, Ph.C.

Michigan State Pharmaceutical Association.—Charles W. Parsons, Ph.C., F. A. Thompson, Ph.C., * Stanley E. Parkill, Ph.C. *Alternate*, O. C. Johnson, A.M., Ph.C.

MINNESOTA.

Minnesota State Pharmaceutical Association.—* Adolph Stierle, * E. F. Allen, Ph.G., * Karl Simmon.

MISSOURI.

Verein Deutscher Aerzte.—Charles O. Curtman, Ph.G., M.D.

St. Louis Medical Society.—Charles O. Curtman, Ph.G., M.D., Otto A. Wall, Ph.G., M.D.

Missouri Medical College.—Charles O. Curtman, Ph.G., M.D.

Missouri State Pharmaceutical Association.—G. H. Charles Klie, Ph.G., H. M. Whelpley, Ph.G., M.D., C. E. Corcoran.

St. Louis College of Pharmacy.—James M. Good, Ph.G., O. A. Wall, Ph.G., M.D., F. W. Sennewald. *Alternates*, G. H. C. Klie, Ph.G., H. M. Whelpley, Ph.G., M.D.

Kansas City College of Pharmacy.—W. T. Ford, Ph.G., Claude C. Hamilton, M.D., *Julius G. Kiefer, Ph.G., M.D.

NEW HAMPSHIRE.

Dartmouth Medical College (of Hanover).—Henry M. Field, M.D.

New Hampshire Pharmaceutical Association.—*E. H. Currier, M.D., *Charles B. Spofford, Albert S. Wetherell.

NEW JERSEY.

Medical Society of New Jersey.—Dowling Benjamin, M.D., *Charles P. Britton, M.D., *Hiram H. Tichenor, M.D.

New Jersey Pharmaceutical Association.—H. P. Reynolds, Charles Holzhauer, Ph.G., *Fred. B. Kilmer.

NEW YORK.

Medical Society of the State of New York.—Laurence Johnson, M.D., *E. V. Stoddart, M.D., John M. Bigelow, M.D.

New York Academy of Medicine.—Frederick A. Castle, M.D., *Andrew H. Smith, M.D., George G. Needham, Ph.G., M.D.

Medical Society of the County of Kings.—Frank E. West, M.D., *Charles E. De La Vergne, M.D., *Joseph H. Hunt, M.D.

College of Physicians and Surgeons in the City of New York (Medical Department of Columbia College).—G. L. Peabody, M.D.

University of the City of New York, Medical Department.—W. H. Thomson, M.D.

Albany Medical College.—*Maurice Perkins, M.D., *J. M. Bigelow, M.D., William P. Mason, M.D. *Alternates*, H. E. Webster, LL.D., Frederic C. Curtis, M.D., Willis G. Tucker, M.D.

University of Buffalo, Medical Department.—John R. Gray, Ph.G., M.D.

Buffalo College of Pharmacy (Department of Pharmacy of the University of Buffalo).—F. P. Vandenberg, B.S., M.D., Willis G. Gregory, Ph.G., M.D., Eli H. Long, M.D.

Cornell University, School of Pharmacy.—*George C. Caldwell, Ph.D., *S. B. Newbury, Ph.D., W. A. Viall.

College of Pharmacy of the City of New York.—Charles Rice, Ph.D., P. W. Bedford, Ph.G., H. H. Rusby, M.D.

Literary and Scientific Society of the German Apothecaries of the City of New York.—Adolph Tscheppe, Ph.D., Gustavus Ramsperger, Gustavus Pfingsten, M.D. *Alternate*, Henry Schmid, Ph.G.

Long Island College Hospital.—John A. McCorkle, M.D., Frank E. West, M.D., E. H. Bartley, M.D.

Syracuse University, College of Medicine.—*John L. Heffron, M.D.

New York State Pharmaceutical Association.—Robert G. Eccles, M.D., Thomas J. Macmahan, Clay W. Holmes. *Alternate*, C. S. Ingraham.

Kings County Pharmaceutical Society.—Luther F. Stevens, Donald L. Cameron, Charles W. Brunner, M.D.

Albany College of Pharmacy.—A. B. Husted, M.D., *Gustavus Michaelis.

NORTH CAROLINA.

North Carolina Medical Society.—T. F. Wood, M.D., R. S. Young, M.D., *J. M. Baker, M.D.

North Carolina Pharmaceutical Association.—*E. V. Zoeller, Ph.G., *E. M. Nadal, *J. L. Prior.

OHIO.

Miami Medical College (Cincinnati).—Dan. Millikin, M.D.

Cincinnati College of Pharmacy.—*Charles T. P. Fennel, Ph.G., *George Merrell, *George Eger.

Ohio State Pharmaceutical Association.—*Lewis C. Hopp, Ph.G., *T. L. A. Greve, M.D., *Charles Huston.

PENNSYLVANIA.

Philadelphia County Medical Society.—Horatio C. Wood, M.D., LL.D., L. Wolff, M.D., *F. Woodbury, M.D.

College of Physicians of Philadelphia.—W. S. Ruschenberger, M.D., I. Minis Hays, M.D., James C. Wilson, M.D.

University of Pennsylvania, Department of Medicine.—T. G. Wormley, M.D., *John Marshall, M.D., *Samuel G. Dixon, M.D.

Jefferson Medical College (Philadelphia).—Roberts Bartholow, M.D., LL.D., J. W. Holland, M.D.

Medico-Chirurgical College of Philadelphia.—J. V. Shoemaker, M.D., John Aulde, M.D., Henry Fisher, M.D.

Philadelphia Polyclinic and College of Graduates in Medicine.—*Solomon Solis-Cohen, M.D., *Henry Leffmann, M.D., D.D.S., *Thomas J. Mays, M.D.

Woman's Medical College of Philadelphia.—*Clara Marshall, M.D., *Henry Leffmann, M.D., D.D.S., *James B. Walker, M.D.

Pennsylvania Pharmaceutical Association.—Charles T. George, Louis Emanuel, A. R. Durham.

Philadelphia College of Pharmacy.—John M. Maisch, Phar.D., Joseph P. Remington, Ph.M., Samuel P. Sadtler, Ph.D.

Pittsburgh College of Pharmacy.—J. A. Koch, Ph.G., James B. Cherry, Adolph Koenig, M.D.

Powers College of Pharmacy and Chemistry (Philadelphia).—* James Van Buskirk, M.D., Lemuel J. Deal, M.D., F. E. Stewart, M.D.

Pennsylvania College of Pharmacy (Philadelphia).—Martin Roche, M.D., Henry C. Archibald, M.D.

RHODE ISLAND.

Rhode Island Pharmaceutical Association.—Frank A. Jackson, * A. L. Calder, * Norman N. Mason.

SOUTH CAROLINA.

South Carolina Pharmaceutical Association.—* E. S. Burnham, A. A. Kroeg, * L. G. Wood.

SOUTH DAKOTA.

South Dakota Pharmaceutical Association.—* G. W. Lowry, * Julius Deetkin, J. C. Donaldson.

TENNESSEE.

Nashville Academy of Medicine and Surgery.—* O. H. Menecs, M.D.

TEXAS.

Texas State Medical Association.—* A. N. Denton, M.D., * Q. C. Smith, M.D.

Texas State Pharmaceutical Association.—* James Kennedy, Ph.G.

VIRGINIA.

Medical Society of Virginia.—* R. M. Slaughter, M.D., William B. Towles, M.D., J. N. Upshur, M.D.

University of Virginia.—J. W. Mallett, M.D.

Virginia Pharmaceutical Association.—Robert Brydon, T. Roberts Baker, C. B. Fleet.

WISCONSIN.

Wisconsin Pharmaceutical Association.—C. H. Bernhard, Ph.G., * J. C. Huber, * A. Conrath, Ph.G.

University of Wisconsin, School of Pharmacy.—F. B. Power, Ph.D.

AT LARGE.

American Medical Association.—H. A. Hare, M.D., * Elmer Lee, M.D., * N. S. Davis, Jr., M.D.

American Pharmaceutical Association.—Alfred B. Taylor, A.M., Ph.M., Albert E. Ebert, Ph.G., William Simpson. *Alternate*, C. S. N. Hallberg, Ph.G.

U. S. Army, Medical Department.—W. M. Mew, M.D.

U. S. Navy, Medical Department.—James M. Flint, M.D.

U. S. Marine Hospital Service.—* C. S. D. Fessenden, M.D., * Walter Wyman, M.D., John Godfrey, M.D.

A Nominating Committee consisting of one delegate from each body represented, numbering 111 members, including one each from the Army, the Navy, and the Marine Hospital Service, subsequently nominated the following gentlemen as permanent officers of the Convention :

President: Horatio C. Wood, M.D., LL.D., of Philadelphia.

First Vice-President: W. S. Thompson, of Washington.

Second Vice-President: J. M. Flint, M.D., U. S. Navy.

Third Vice-President: D. Webster Prentiss, M.D., of Washington.

Fourth Vice-President: Albert E. Ebert, Ph.G., of Chicago.

Fifth Vice-President: W. M. Scarby, Ph.G., of San Francisco.

Secretary: H. A. Hare, M.D., of Philadelphia.

Assistant Secretary: G. H. Charles Klie, of St. Louis, Mo.

All these gentlemen were duly elected by the Convention. The Nominating Committee also presented the following names for the Committee of Revision and Publication of the Pharmacopœia of the United States of America :

Messrs. Roberts Bartholow, P. Wendover Bedford, Frederick A. Castle, Charles O. Curtman, N. S. Davis, Jr., C. Lewis Diehl, Robert G. Eccles, Robert T. Edes, James M. Flint, John Godfrey, Willis G. Gregory, C. S. N. Hallberg, John M. Maisch, George F. H. Markoe, William M. Mew, Charles Mohr, Oscar Oldberg, Frederick B. Power, Joseph P. Remington, Charles Rice, Henry H. Rusby, Lucius E. Sayre, Alfred B. Taylor, Otto A. Wall, Thomas F. Wood.

Subsequently, the President of the Convention, Dr. Horatio C. Wood, was added to the Committee as an ex-officio member.

Mr. P. W. Bedford, the Secretary of the Committee of Revision and Publication, presented the following report :

Report of the Secretary of the Committee of Revision and Publication of the Pharmacopœia of the United States of America.

WASHINGTON, May 7, 1890.

The Committee of Revision and Publication of the Pharmacopœia of the United States of America, which was elected at the last Decennial Convention, herewith respectfully submits a report of its proceedings.

Immediately after the close of the Convention the Committee organized by electing officers, and a second meeting was held before the

members left Washington. At these meetings the general plan for carrying on the work of revision was discussed, and a number of preliminary details settled. As it was impossible to hold frequent meetings, owing to the distances separating the members of the Committee, it was decided to carry on the interchange of discussions and arguments, and the voting on motions and propositions, by means of circulars.

There being no funds for paying its current expenses, a proposition made by the Finance Committee to borrow \$1200 for eight months was adopted. This loan was subsequently reduced to a sum of \$800 and extended for six months longer. In September, 1880, a third meeting of the Committee was held at Saratoga, at which Albert B. Prescott, M.D., of Ann Arbor, and Emil Scheffer, Ph.G., of Louisville, were elected members, in place of T. G. Wormley, M.D., and Edward R. Squibb, M.D., resigned.

Concerning the changes in the text of the Pharmacopœia, and all other details of general interest regarding the work of revision, a report has been already published in the preface of the Pharmacopœia of 1880, pages 27 and 28, reference to which is invited.

When the manuscript of the work was near its completion, the Committee on Copyright, which had meanwhile been appointed, solicited bids for the publication of this work. Six bids having been received in response to this invitation, the Committee accepted that presented by William Wood & Co., and awarded the contract to that firm. The work was then put to press, and was issued to the public during the last week of October, 1882.

On September 9, 1882, the Committee lost by death one of its members, Dr. Benjamin F. Gibbs, U.S.N. The vacancy was filled in April, 1883, by the election of D. Webster Prentiss, M.D., of Washington. Previous to this election a plan for filling vacancies in the Committee was adopted, according to which only delegates to the Pharmacopœial Convention should be regarded as eligible.

A fourth meeting of the Committee was held at Washington on September 11, 1883. During the year 1884 the advisability of publishing a supplement—authorized by the last Convention—was discussed. After a careful consideration of the claims advanced in favor of a number of new drugs, chemicals, and preparations, it was decided that they were not so numerous or important as to require the publication of a supplement.

Another serious loss befell the Committee through the death, on August 21, 1885, of Henry B. Parsons, Ph.C. This vacancy has been allowed to remain unfilled.

During the year 1886 the Committee undertook to collect statistics regarding the frequency with which the various pharmacopœial articles were prescribed in the different sections of the country. A table of the official titles was printed, and copies were furnished to those bodies or individuals who agreed to obtain the desired data. While a number of returns have been received, and the thanks of the Committee are due to the contributors, yet it must be stated that the results are only partly of practical use, since most of them apply only to the experience of individuals or limited localities. In 1888 it was resolved to make a collection of criticisms on the United States Pharmacopœia from the literature published since the issue of the work, and the Chairman was authorized to employ an expert to make the compilation. As a result, the Committee has published a Digest of Criticisms on the United States Pharmacopœia, in three parts, which, it is hoped, will lighten the labors of the next Committee. By direction of the Decennial Convention of 1880, this Committee is required to present a complete plan for the revision of the Pharmacopœia at the present Convention. In obedience to this instruction, the Committee has, at a final meeting held on May 7, 1890, deliberated on the general principles which should, in its judgment, be followed in the next revision. These general principles will be submitted to this Convention, in a separate report, for action. The total income of the Committee from all sources up to the present date has been \$11,715.27. The expenses up to now have been \$8902.42. The balance on hand is \$2812.85, which sum is now in the hands of the Treasurer of the Committee, and is subject to the disposition by vote of the Convention of 1890.

P. W. BEDFORD, *Secretary*.

Suggestions for the Revision of the Pharmacopœia were then received from the American Association for the Advancement of Science, the Kansas City Pharmaceutical Association, the Pharmaceutical Association of Delaware, St. Louis College of Pharmacy, Illinois Pharmaceutical Association, College of Physicians of Philadelphia, Philadelphia College of Pharmacy, Arkansas Medical College, New York State Pharmaceutical Association, Buffalo College of Pharmacy, Arkansas Association of Pharmacists, Alumni Association of the Albany College of Pharmacy, Louisiana State Pharmaceutical Association, and Albany College of Pharmacy.

The Treasurer of the Committee of Revision of 1880 was directed to pay over any balance remaining in his hands to the Treasurer of the new Committee of Revision.

The following Resolutions were adopted at subsequent meetings of the Convention :

I. GENERAL PRINCIPLES TO BE FOLLOWED IN REVISING THE PHARMACOPŒIA.

1. *Assay Processes for Drugs.*—It is recommended that assay processes be appended to the descriptions of the more energetic or otherwise important drugs containing active principles, provided the therapeutic value of the drug depends upon the amount of these principles, and provided, also, that these principles can be assayed and identified with reasonable accuracy and without requiring complicated processes. The Committee may attach a note stating the usual percentage of these active principles in good commercial samples of the drug, and, if it be found feasible, it may attach a requirement that the drug shall not be used unless it conforms to these stated limits.

2. *Assay Processes for Galenical Preparations.*—The Committee may attach assay processes to such galenical preparations as fluid extracts, tinctures, etc., but it shall omit requirements of a definite strength or percentage of active principles, except in the case of drugs for which an upper or lower limit, or both, of active principles is prescribed.

3. *Assay Processes for Opium and Cinchona.*—In the case of Opium and Cinchona, the Committee shall adopt such processes of assay as will be found to yield the largest proportions of the desired active principles with greatest uniformity and with least manipulative difficulty, the object of these processes being to ascertain how much of the respective principles can practically be extracted.

4. *Descriptions of Chemicals and Tests.*—In the case of chemicals, the degree of purity, or the allowable percentage of impurity, shall be prescribed as closely as practicable. The standard of purity shall be set as high as practicable for legal enforcement, but not beyond a point reasonably attainable by the manufacturer without subjecting any particular product to unnecessary cost, through the enforced removal of some harmless and insignificant, accidental impurity.

5. *Chemical Formulæ.*—Chemical formulæ shall be given only in the new notation.

6. *Proprietary or Patented Articles.*—No substance which cannot be produced otherwise than under a patented process, or which is protected by proprietary rights, shall be introduced into the Pharmacopœia.

7. *Nomenclature.*—In the choice of titles of official articles it is recommended that convenience, established custom, and considera-

tions of safety against mistakes through similarity or changes in names, should outweigh purely theoretical considerations or scientific preciseness.

8. *Specific Gravity*.—It is recommended that the Committee define the exact degree of temperature of the standard by which other specific gravities are to be determined, and the specific gravities of the various official liquids shall be determined, and stated, by the Committee, so far as it may be practicable, on the basis of the established temperature and other conditions of the standard.

9. *Strength of Tinctures, Acids, etc.*—The Committee of Revision is authorized, if in its judgment considered best, to make the strength of all official tinctures and wines ten per cent.; also to make the diluted acids of the strength of ten per cent. of official (not absolute) acid; also to make the fluid extracts of the strength of fifty per cent. Infusions and decoctions are to be of the strength of five per cent., instead of ten per cent. as at present.

10. *Weights and Measures*.—The Committee of Revision is instructed to direct solids to be weighed and liquids to be measured, except in those cases in which the Committee finds it advisable to use definite weights only, and it is ordered that the metric system be employed for that purpose.

11. *General Formulæ*.—It is recommended that general formulæ be introduced for fluid extracts, and such other preparations as are made by identical processes, and that the general formula to be followed in any particular case be merely indicated by reference.

12. *List of Reagents, Tables, etc.*—The tables and list of reagents authorized or prescribed for the Pharmacopœia of 1880 shall also be inserted in that of 1890, with such corrections or substitutions as may be required to bring them up to date.

13. *Compensation of Experts*.—The Committee of Revision is instructed to pay the experts and others employed in the preparation and publication of the Seventh Decennial Revision of the Pharmacopœia.

14. *Publication of the Pharmacopœia*.—The Committee of Revision shall be authorized to print and publish, on its own account, the Seventh Decennial Revision of the Pharmacopœia of the United States of America.

15. *Date for the Pharmacopœia to go into Effect*.—The Committee shall announce in a conspicuous place in the printed work a definite date, reasonably distant from the actual date of publication, when the new Pharmacopœia is intended to go into effect and to supersede the preceding one.

II. RESOLUTIONS REGARDING THE BASIS OF REPRESENTATION IN THE DECENNIAL CONVENTION OF 1900.

1. The President of this Convention shall, on or about the first day of May, 1899, issue a notice requesting the several bodies represented in the Conventions of 1880 and 1890, and also such other incorporated State Medical and Pharmaceutical Associations, and incorporated Colleges of Medicine and Pharmacy, as shall have been in continuous operation for at least five years immediately preceding, to elect a number of delegates, not exceeding three, and the Surgeon-General of the Army, the Surgeon-General of the Navy, and the Surgeon-General of the Marine Hospital Service, to appoint, each, not exceeding three medical officers, to attend a general Convention for the Revision of the Pharmacopœia of the United States, to be held in Washington, D.C., on the first Wednesday of May, 1900.

2. The several bodies, as well as the medical departments of the Army, Navy, and Marine Hospital Service, thus addressed, shall also be requested by the President to submit the Pharmacopœia to a careful revision, and to transmit the result of their labors, through their delegates, to the Committee of Revision and Publication, at least three months before the meeting of the Convention.

3. The several medical and pharmaceutical bodies shall be further requested to transmit to the President of this Convention the names and residences of their respective delegates as soon as they shall have been appointed, a list of whom shall be published, under his authority, for the information of the medical public, in the newspapers and medical journals, in the month of March, 1900.

4. In the event of the death, resignation, or inability of the President of the Convention to act, these duties shall devolve successively in the following order of precedence: upon the Vice-Presidents, the Secretary, the Assistant Secretary, and the Chairman of the Committee of Revision and Publication of the Pharmacopœia.

5. The Committee is authorized and directed to publish a supplement at the end of five years, if necessary.

6. The Committee shall report a complete plan for the revision of the Pharmacopœia at the next Decennial Convention.

After adopting a vote of thanks for hospitalities extended to the members, the Convention adjourned *sine die*.

PREFACE.

THE Committee of Revision elected by the Decennial Convention of 1890 organized, before leaving Washington, by the election of officers and the adoption of rules for carrying on the work of revision without rendering frequent personal meetings necessary. It was resolved to employ the same methods for circulating reports, presenting motions, etc., as were employed by the preceding Committee (compare U. S. Pharmacopœia, Sixth Decennial Revision, page xxvii). A second meeting of the Committee was held at Old Point Comfort on September 8th to 10th, 1890. At this meeting the scope of the new Pharmacopœia was fully discussed, and a preliminary list of articles to be discarded, or to be newly introduced, settled upon. This list was subsequently referred to a Sub-Committee on Therapeutics, comprising all the practitioners of medicine on the Committee of Revision, and final action, more particularly respecting articles to be for the first time admitted, was based mainly on the decisions of this Sub-Committee, to which were subsequently also referred, for report or decision, various questions or problems requiring the advice of medical experts. The work of revision has been carried on, without interruption, up to the time of commencing to put the text in type (January, 1893), and, as far as was practicable, even up to the time of going to press. The result is herewith submitted to the professions of medicine and pharmacy, and to the public at large.

During the year 1892 the Committee suffered a severe loss by the decease of two of its members,—viz., Prof. P. W. Bedford, of New York (died July 20), and Dr. Thomas F. Wood, of Wilmington, N.C. (died August 22). Both vacancies were allowed to remain unfilled.

Among the subjects brought prominently to the attention of the Convention of 1890 was the establishment of a fixed proportion, or of fixed limits, of the active principles in preparations made from the more energetic drugs capable of being assayed. The matter was very fully discussed, but the Convention finally decided to refer the introduction of assay processes and of so-called standardized preparations to the discretion of the Committee. The Sub-Committee, which was subsequently appointed to take charge of this work, carefully investi-

gated the processes which have, from time to time, been proposed, either as general methods of assay, or as applicable to special drugs, and finally came to the unanimous conclusion that reliable methods of assay, resulting in approximately uniform results when carried out by different operators, and permitting a strict identification of the products, are available, at the present time, for only a few drugs. Particular caution in this matter was rendered advisable, since the pharmacopœial requirements and assay processes are liable to be made the basis of legal prosecution by public analysts or by officials charged with the administration of laws regarding the adulteration of food and drugs, and much injury might result from the introduction of methods of assay which had not been generally proven as trustworthy. After a careful study of the subject, it was resolved to apply processes of assay, in this revision, only to Cinchona, Nux Vomica, and Opium, or to such of their preparations as appeared to require it. There is a fair prospect, however, that a further, extensive study of the problem will render it possible to increase the number of assayed preparations materially at the next revision.

Since no assay processes were appended to other energetic drugs, it was deemed unadvisable to include in their definitions or descriptions any statement of the average amount of active constituents contained or required therein.

In the revision of the descriptions and tests of chemical substances, particular care was bestowed upon the limitation of impurities, by introducing methods of testing which would sharply respond to the established limits wherever possible, or where deemed necessary. The gravimetric method of determination was replaced, as far as practicable, by the volumetric method, thus rendering the examination of these substances much more simple and expeditious. The allowed limits of impurities were fixed after a careful examination of the commercial products, and were in no case made more rigorous than can be readily complied with by any manufacturer without an increase of the cost of these articles.

In giving chemical formulas, the old notation was discarded. Regarding the atomic weights of the elements, the Committee, after discussing the merits of the several systems in vogue, one starting from oxygen = 16 (when hydrogen has the atomic weight 1.007), the other being based on hydrogen = 1 (when oxygen = 15.96), finally decided in favor of the latter, and adopted the latest values published by L. Meyer and K. Seubert, in order to remain in harmony with most analysts throughout the world, who base their calculations upon these figures. It was not deemed advisable to round off the figures to whole

numbers, or to fractions with only one decimal, as is often done in technical analysis, this being left to the individual judgment of the operator.

In accordance with the positive instructions of the Convention, those of the new synthetic remedies which cannot be produced otherwise than under patented processes, or which are protected by proprietary rights, were not admitted into the Pharmacopœia.

A strong effort is at present being made both in Europe and in this country, though not, as yet, by concerted action, to reform the chemical nomenclature, more particularly with the object of making the name of a substance convey, as far as possible, some information as to its nature or constitution, or as to the class to which it belongs. An appeal was made to the Committee of Revision to join in the movement, in fact, to adopt the newly-proposed spellings and terms. Among these propositions were the spellings : bromin, chlorin, fluorin, and iodin, for bromine, chlorine, fluorine, and iodine ; bromid, chlorid, iodid, oxid, sulphid, etc., for bromide, chloride, iodide, oxide, sulphide, etc. ; aconitin, morphin, quinin, etc., for aconitine, morphine, quinine, etc. (thus abolishing the hitherto prevailing distinction in spelling between alkaloids and so-called neutral principles) ; sulfur, sulfate, etc., for sulphur, sulphate, etc. ; glycerol, benzene, etc., for glycerin, benzol, etc. While some of the members, individually, were willing to approve and adopt at least some of these new spellings in their professional writings, the decision, so far as the Pharmacopœia is concerned, was almost unanimously against their adoption at this time, it being deemed unsafe and unnecessary to inaugurate such radical changes, not yet generally accepted or followed in practice, in the names of medicines familiar, under their present garb, to so large a proportion of the population.

The Committee was, however, quite prepared to introduce a change in chemical nomenclature in another direction,—namely, in the designation of chemical compounds (oxides, salts, etc.), in which it is now customary to put the basylous or metallic component first,—viz., sodium chloride, silver nitrate, lithium bromide, lead oxide, etc., instead of writing chloride of sodium, nitrate of silver, bromide of lithium, oxide of lead, etc. In the case of the salts of iron and mercury this change involved also the use of the respective terms in *-ous* and *-ic* (ferrous and ferric, mercurous and mercuric), which greatly help to distinguish salts heretofore frequently confounded. As a matter of precaution, however, the distinguishing adjectives “corrosive,” “mild,” “yellow,” “red,” etc., have been left in the titles of the respective mercury compounds, for instance, “Corrosive Mercuric Chloride,” “Mild Mercu-

rous Chloride," etc. In the case of complex iron preparations, such as the so-called scale salts (Ferri et Ammonii Citras, Ferri et Ammonii Tartras, etc.), which are not true chemical salts, yet all of which contain the iron in a ferric condition, the word "iron" was left unchanged, to avoid the impression that they are definite, double salts.

In botanical nomenclature, the rules adopted, in 1892, by the Botanical Club of the American Association for the Advancement of Science have been adopted. These rules are as follows :

I. In nomenclature, the Paris Code of 1867 shall be followed, except where it conflicts with the following :

1. *The Law of Priority*.—Priority of publication is to be regarded as the fundamental principle of botanical nomenclature.

2. *Beginning of Botanical Nomenclature*.—The botanical nomenclature of both genera and species is to begin with the publication of the first edition of Linnaeus' *Species Plantarum*, in 1753.

3. *Stability of Specific Names*.—In the transfer of a species to a genus other than the one under which it was first published, the original specific name is to be retained, unless it is identical with the generic name, or with a specific name previously used in that genus.

4. *Homonymes*.—The publication of a generic name or of a binomial invalidates the use of the same name for any subsequently published genus, or species, respectively.

5. *Publication of Genera*.—Publication of a genus consists only (1) in the distribution of a printed description of the genus named; or (2) in the publication of the name of the genus, and the citation of one or more previously-published species as examples or types of the genus, with or without a diagnosis.

6. *Publication of Species*.—Publication of a species consists only (1) in the distribution of a printed description of the species named; or (2) in the publication of a binomial, with reference to a previously-published species as a type.

7. *Similar Generic Names*.—Similar generic names are not to be rejected on account of slight differences, except in spelling of the same word; for example, *Apios* and *Apium* are to be retained, but of *Epidendrum* and *Epidendron*, *Asterocarpus* and *Astrocarpus*, the later is to be rejected.

8. *Citation of Authorities*.—In the case of a species which has been transferred from one genus to another, the original author must always be cited in parentheses, followed by the author of the new binomial.

II. The limitations of genera given in Bentham and Hooker's *Genera Plantarum* shall be followed, except where an obvious error is involved.

III. In species limitations those authors should be followed whose views appear to us correct.

Certain minor details regarding the spelling, mode of printing, interpunction, etc., to be followed in botanical names, all in accordance with the Paris Code of 1867, are repeated here from the preface to the last Pharmacopœia, for ready reference :

Species names are written or printed with a small initial letter, even if derived from geographical names, *except* :

1. When the species name had, at any previous time, itself been a genus name,—*e.g.*, *Datura Stramonium*; *Rhamnus Frangula*; *Solanum Dulcamara*.

2. When the species name is derived from the name of a person,—*e.g.*, *Aloe Perryi*; *Garcinia Hanburii*; *Pilocarpus Selloanus*.

3. When it is an indeclinable noun or a combination of a noun and an adjective,—*e.g.*, *Acacia Senegal*; *Erythroxylon Coca*; *Xanthoxylum Clava-Herculis*.

4. Genus and species names, when printed, are to be in type different from that of the author's name, which should follow the binomial without interpunction.

In botanical works it is customary to abbreviate the authors' names. In this Pharmacopœia they are printed in full.

It was not deemed advisable to make the tinctures of a uniform strength of 10 per cent., as suggested by the Convention, because it was feared that more harm would be done by the great change, than good accomplished by making them uniform. In the case of diluted acids the strength was fixed on the basis of absolute acid. A special Sub-Committee was charged with the investigation of the feasibility of introducing a class of 50-per-cent. liquid preparations of vegetable drugs (so-called 50-per-cent. fluid extracts) which it was thought could be readily prepared by a single percolation requiring only in a few cases the collection and evaporation of a second, dilute perecolate. It was found that in the case of a number of drugs such preparations might be made, but that in many others it was not practicable without complicating the process. The Committee, therefore, decided to drop the subject.

As directed by the Convention, the Committee has in most cases employed definite weights for solids, and measures for liquids, in terms of the metric system. In certain cases, where weighing is decidedly

more convenient, or where the product is adjusted to a percentage by weight which would be rendered uncertain if the ingredients were taken by measure, liquids were ordered to be weighed. And in some cases (*Aqua Destillata*, *Aqua Aurantii Florum*, etc.) the quantities are directed simply by volume.

It was recommended by the Convention that general formulæ be introduced for fluid extracts and similar preparations, so as to render the repetition of the directions, in each separate case, unnecessary. Upon making an actual trial of this method, however, upon the formulæ of the fluid extracts and tinctures, it was found to be much less convenient than the present arrangement.

The List of Reagents has been carefully prepared. While it is not intended, in any sense, to be didactic, but presupposes a knowledge of elementary chemical analysis, yet the Committee deemed it not out of place to add explanatory remarks or instructions in details of manipulation, in order to render reference to other works, as far as possible, unnecessary.

In March, 1892, the Sub-Committee on Reagents and Inorganic Chemicals published, by authority of the Committee of Revision, a pamphlet containing the text of the Reagents and Volumetric Solutions, so far as it was completed at that time. This publication has been of material value, since it elicited various useful suggestions calculated to render the final text more perfect, and made reference to the tests, during the preparation or revision of the text of the chemicals, easy and convenient.

Shortly after the appearance of the last Pharmacopœia it was shown that *Hehner's* alcohol tables, which had there been inserted, were based on data differing from those usually employed in this country. It therefore became necessary to replace them by others. After examining all those which were available, it was decided that it would be best, at present, to use that table which is most in harmony with the practice of the Bureau of Internal Revenue, viz., that which bases the volume percentage upon *Tralles' table*, and the weight percentage upon *Fownes'*, though both of these will, eventually, have to give way to more correct tables, the general acceptance of which, however, can be brought about only if they are worked out by a Committee of Experts appointed by the Government, and then made a legal standard by an act of Congress. The table which was finally selected, and which is based on *Tralles'* and *Fownes'* figures, is that published by *Dr. Edward R. Squibb* (*Ephemeris*, II., pp. 563-575), who kindly placed it freely at the disposal of the Committee. This contains many features which will render it exceedingly useful in practice.

In the case of mineral acids, the faulty condition of Kolb's tables was long ago demonstrated by Prof. G. Lunge, of Zurich, who has also published elaborate new tables for hydrochloric, nitric, and sulphuric acids, which are now generally accepted as the most trustworthy in existence. In these tables, however, all specific gravities are reduced, by calculation, to the temperature of 15° C., as compared with water at 4° C. (which is expressed, in the tables, by the conventional term $\frac{15^{\circ} \text{C.}}{4^{\circ} \text{C.}}$), and for *weight in vacuo*, while ordinary practice demands a table showing specific gravities at 15° C., as compared with water at the *same temperature* ($\frac{15^{\circ} \text{C.}}{15^{\circ} \text{C.}}$), and for *weight in air*. The Committee applied to Prof. Lunge for authority to use his tables and also to insert a column in which the author's values for specific gravity were to be given for 15° C. (59° F.), as compared with water at 15° C. (59° F.), weighed in air. Prof. Lunge not only gave his immediate consent, but also examined the figures recalculated by this Committee, and the tables are published with his full concurrence and authority. The same permission was obtained for using his table for ammonia. For phosphoric acid, Dr. A. B. Lyons' table was introduced, and for soda and potassa those of Gerlach, based upon the determinations of H. Schiff. The Saturation Tables have been carefully recalculated on the basis of the adopted standards of strength, or percentage of pure substance, of the respective acids, alkalies, and salts, and their corresponding molecular weights.

Concerning the changes made in the strength of some of the pharmacopœial articles a few explanations may be desirable. The alterations in the percentage and specific gravity of hydrochloric, nitric, and sulphuric acids were made partly on the strength of information received from the manufacturers of these acids in this country, and partly on the strength of Lunge's tables, supported by experiment. The 50-per-cent. phosphoric acid heretofore official was replaced by the so-called syrupy acid, which is now manufactured on a very large scale, and can no longer be profitably made by the pharmacist. Among pharmaceutical preparations, those of Nux Vomica deserve special mention. In the extract the quantity of alkaloids, as determined by the official process, has been fixed at 15 per cent., and that in the tincture at 0.3 Gm. in 100 Cc., which proportions are believed to correspond approximately with the strength of the same preparations now in use, if skilfully made from a drug of good quality. All the changes made in the more important preparations designed for internal use will be found in the table on page lviii.

The present Pharmacopœia contains 994 articles, ninety-two of those

previously official having been dismissed, while eighty-nine new ones have been introduced (see the lists on pages xlvii to l).

The titles of a number of official articles were altered mostly for the purpose of bringing them in harmony with the principles of nomenclature followed in other parts of the work, or to make them more expressive of the character of the article or preparation which they designate. Among these changes the following deserve special mention. The term "Æther" (Ether) is now applied to the "stronger ether" of previous *Pharmæopœias*, and commercial ether has been discarded. Commercial chloroform has also been dismissed, and the term "Chloroformum" now applies to the purified article. A new term, "Emulsum," has been introduced, and has been substituted, in place of the word "Mistura," in certain liquid preparations which are, properly speaking, emulsions.

It was not deemed necessary to quote all the former official titles which were altered, as synonyms under the corresponding new titles, particularly when the alteration was but a trifling one, or when no confusion could be caused by the omission. A complete list of the changes will, however, be found on page li. A synoptical list of the English titles which were altered in this revision is given on page liii.

It will be observed that the word "official" has been used in this edition of the *Pharmæopœia*, in place of the word "offieinal." This change was made by a special vote of the Committee at one of its first meetings in 1890. The adoption of the *Pharmæopœia* as a standard authority by the Government and by a number of the States justifies the use of the word "official," which is now generally understood to be synonymous with "pharmæopœial," and is applied to any substance or preparation recognized by the *Pharmæopœia*.

It has been customary, when quoting any special edition of the *Pharmæopœia*, to designate it by the year in which the Convention authorizing its publication held its meeting (1820, 1830, 1840, etc.). In order to secure a more general adoption of this custom, the year "(1890)" has, in this issue, been printed on the title-page.

Each authentic copy of the *Pharmæopœia* of 1890 bears, attached to the back of the title-page, a coupon upon which are printed a serial letter and a number, and the following words: "Pharmacopœia of the United States of America. Seventh Decennial Revision (1890). Official copy. Copyright."

Among the tables appended to the work there will be found several new ones. One of these is a Table of the Multiples of some Atomic and Molecular Weights in Frequent Use, a Table of Equivalents of Measures of Length, customary and decimal, and a Table of Equiva-

lents of Weights and Measures, customary and decimal, which is arranged after the plan of a table published, in 1876, by William Wood & Co., of New York, who placed it at the disposal of the Committee. And in order to facilitate ready reference to the formulas and molecular weights of the chemical substances occurring in the official text or among the reagents, a special list of them has been added (see pages 515-522). All these tables, it is hoped, will be found useful in practice.

The Committee is greatly indebted to many gentlemen, not members of it, for most valuable assistance, rendered either by undertaking experimental researches, sometimes very protracted and laborious, on certain subjects, or by placing material at the disposal of the Committee, or by scrutinizing the proof-sheets. Some of them rendered aid in all the directions mentioned from the beginning to the end.

For general and continuous aid, especial thanks are due to Dr. Edward R. Squibb, of Brooklyn, N.Y.; Prof. Charles Caspari, Jr., Ph.G., of Baltimore; Prof. Edgar L. Patch, Ph.G., and Mr. F. T. Drake, Ph.G., of Stoneham, Mass.; Prof. Virgil Coblentz, Ph.D., and Prof. Arthur H. Elliott, Ph.D., of New York.

For special assistance in various subjects acknowledgments are due to the following gentlemen: At Ann Arbor: Prof. A. B. Stevens, Ph.C. At Baltimore: Messrs. Louis Dohme, Ph.G., Alfred R. L. Dohme, Ph.D., and Prof. W. Simon, Ph.D., M.D. At Bethlehem: Mr. C. L. Lochman. At Boston: Bennett F. Davenport, M.D. At Cincinnati: Prof. Chas. T. P. Fennel, Ph.G., and Prof. J. U. Lloyd. At Detroit: Messrs. J. B. Nagelvoort, Ph.C., and F. A. Thompson, Ph.C. At Easton, Pa.: Prof. Edward Hart, Ph.D. At New York: Messrs. Frederick Hoffmann, Ph.D., Theodore Weicker, Henry Kraemer, Ph.G., Adolph Tscheppe, Ph.D., and J. Howard Wainwright, Ph.D. At Philadelphia: Prof. Henry Trimble, Ph.M., and Mr. F. X. Moerk, Ph.G. At St. Louis: Prof. Francis Hemm, Ph.G., and Mr. Edward Mallinckrodt. At Washington: Prof. F. W. Clarke, Ph.D.

Valuable information has also been freely placed at the disposal of the Committee, either voluntarily, or in response to inquiries addressed to them, by many of the manufacturing firms of this country, and also by several abroad.

The Committee has made use of the authority given by the Convention, and has published the work at its own expense, retaining its exclusive control and ownership. In accordance with the instructions of the Convention, a date has been set on which the present work is to supersede the Sixth Revision of the U. S. Pharmacopœia and to go into effect. This date is January 1, 1894.

The Committee finally desires to announce that all communications addressed to any member thereof, or to the Chairman, and containing suggestions for improvements of the Pharmacopœia, will be thankfully received, carefully considered, and utilized as far as possible.

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PRELIMINARY NOTICES.

FINENESS OF POWDER.

THE fineness of powder is expressed, in the Pharmacopœia, either by descriptive words (generally so in the case of brittle or easily pulverizable substances), or in terms expressing the number of meshes to a linear inch of the sieve through which the powder will pass. The corresponding values, in terms of metric measures of length, are added below in parentheses, but it has not been deemed advisable, in this revision, to substitute them in the text of the Pharmacopœia for those at present in use.

These different forms of expression correspond to each other as follows :

A <i>very fine</i> powder	{ should pass through a sieve having 80 or more meshes to the linear inch (30 meshes to the centimeter)	= No. 80 powder.
A <i>fine</i> powder	{ should pass through a sieve having 60 meshes to the lin- ear inch (24 meshes to the centimeter)	= No. 60 powder.
A <i>moderately fine</i> powder	{ should pass through a sieve having 50 meshes to the lin- ear inch (20 meshes to the centimeter)	= No. 50 powder.
A <i>moderately coarse</i> powder	{ should pass through a sieve having 40 meshes to the lin- ear inch (16 meshes to the centimeter)	= No. 40 powder.
A <i>coarse</i> powder	{ should pass through a sieve having 20 meshes to the lin- ear inch (8 meshes to the centimeter)	= No. 20 powder.

In certain cases, powders of a different degree of fineness (*e.g.*, No. 30, No. 12) are directed to be taken.

When a substance is directed to be in powder of a limited degree of fineness, as specified by the number of meshes to the linear inch in

the sieve, not more than one-fourth of the powder should pass through a sieve having ten meshes more to the linear inch.

PERCOLATION.

The process of percolation, or displacement, directed in this Pharmacopœia, consists in subjecting a substance or a mixture of substances, in powder, contained in a vessel called a percolator, to the solvent action of successive portions of a certain menstruum in such a manner that the liquid, as it traverses the powder in its descent to the receiver, shall be charged with the soluble portion of it, and pass from the percolator free from insoluble matter.

When the process is successfully conducted, the first portion of the liquid, or percolate, passing through the percolator, will be nearly saturated with the soluble constituents of the substance treated; and if the quantity of menstruum be sufficient for its exhaustion, the last portion of the percolate will be nearly free from color, odor, and taste, other than those of the menstruum itself.

The percolator most suitable for the quantities contemplated by this Pharmacopœia should be nearly cylindrical, or slightly conical, with a funnel-shaped termination at the smaller end. The neck of this funnel-end should be rather short, and should gradually and regularly become narrower towards the orifice, so that a perforated cork, bearing a short glass tube, may be tightly wedged into it from within until the end of the cork is flush with the outer edge of the orifice. The glass tube, which must not project above the inner surface of the cork, should extend from 3 to 4 Cm. beyond the outer surface of the cork, and should be provided with a closely fitting rubber tube, at least one-fourth longer than the percolator itself, and ending in another short glass tube, whereby the rubber tube may be so suspended that its orifice shall be above the surface of the menstruum in the percolator, a rubber band holding it in position.

The shape of a percolator should be adapted to the nature of the drug to be operated upon. For drugs which are apt to swell, particularly when a feebly alcoholic or an aqueous menstruum is employed, a *conical* percolator is preferable. A *cylindrical* or only slightly tapering percolator may be used for drugs which are not liable to swell, and when the menstruum is strongly alcoholic, or when ether or some other volatile liquid is used for extraction. The size of the percolator selected should be in proportion to the quantity of drug extracted. When properly packed in the percolator, the drug should not occupy more than two-thirds of its height. The percolator is best constructed

of glass or stone-ware, but, unless otherwise directed, may be made of any suitable material not affected by the drug or menstruum.

The percolator is prepared for percolation by gently pressing a small tuft of cotton into the neck above the cork, a thin layer of clean and dry sand being then poured upon the surface of the cotton to hold it in place.

The powdered substance to be percolated (which must be uniformly of the fineness directed in the formula, and should be perfectly air-dry before it is weighed) is put into a basin, the specified quantity of menstruum is poured on, and it is thoroughly stirred with a spatula, or other suitable instrument, until it appears uniformly moistened. The moist powder is then passed through a coarse sieve—No. 40 powders, and those which are finer, requiring a No. 20 sieve, whilst No. 30 powders require a No. 15 sieve for this purpose. Powders of a less degree of fineness usually do not require this additional treatment after the moistening. The moist powder is now transferred to a sheet of thick paper and the whole quantity poured from this into the percolator. It is then shaken down lightly and allowed to remain in that condition for a period varying from fifteen minutes to several hours, unless otherwise directed; after which the powder is pressed, by the aid of a plunger of suitable dimensions, more or less firmly, in proportion to the character of the powdered substance and the alcoholic strength of the menstruum; strongly alcoholic menstrea, as a rule, permitting firmer packing of the powder than the weaker. The percolator is now placed in position for percolation, and, the rubber tube having been fastened at a suitable height, the surface of the powder is covered by an accurately fitting disk of filtering paper, or other suitable material, and a sufficient quantity of the menstruum poured on through a funnel reaching nearly to the surface of the paper. If these conditions be accurately observed, the menstruum will penetrate the powder equally until it has passed into the rubber tube and has reached, in this, a height corresponding to its level in the percolator, which is now closely covered to prevent evaporation. The apparatus is then allowed to stand at rest for the time specified in the formula.

To begin percolation, the rubber tube is lowered and its glass end introduced into the neck of a bottle previously marked for the quantity of liquid to be percolated, if the percolate is to be measured, or of a tared bottle, if the percolate is to be weighed; and by raising or lowering this receiver the rapidity of percolation may be increased or decreased as may be desirable, care being taken, however, that the rate of percolation, unless the quantity of material be largely in

excess of the pharmacopœial quantity, shall not exceed the limit of ten to thirty drops in a minute. A layer of menstruum must constantly be maintained above the powder, so as to prevent the access of air to its interstices, until all has been added, or the requisite quantity of percolate has been obtained. This is conveniently accomplished, if the space above the powder will admit of it, by inverting a bottle containing the entire quantity of menstruum over the percolator in such a manner that its mouth may dip beneath the surface of the liquid, the bottle being of such shape that its shoulder will serve as a cover for the percolator.

When the dregs of a tincture, or of a similar preparation, are to be subjected to percolation, after maceration with all or with the greater portion of the menstruum, the liquid portion should be drained off as completely as possible, the solid portion packed in a percolator, as before described, and the liquid poured on, until all has passed from the surface, when immediately a sufficient quantity of the original menstruum should be poured on to displace the absorbed liquid, until the prescribed quantity has been obtained. ✓

REPERCOLATION.

Authority is given to employ, in the case of Fluid Extracts, where it may be applicable, the process of Repercolation, without change of the initial menstruum.

GLYCERIN IN SOLID EXTRACTS.

When it is desired to preserve a solid extract (for instance, of Gentian, Taraxacum, etc.) in a plastic condition, suitable for making pills, or for other purposes, it is recommended that there be incorporated with it, after it has been evaporated to the proper consistence, and while it is still warm, 10 per cent. of its weight of glycerin.

SPECIFIC GRAVITY.

The specific gravity of liquids should be ascertained, if accuracy be required, by means of a specific gravity bottle of a suitable capacity, at a definite temperature. The specific gravity of alcohol or of any mixture of alcohol and water may, however, also be ascertained by means of an accurate hydrometer, preferably that prescribed by the United States Government for the use of internal revenue and custom-house officers.

Whenever specific gravity is mentioned in the Pharmacopœia, without a given temperature, it is to be understood to refer to a

temperature of 15° C. (59° F.) as compared with water at the same temperature.

TEMPERATURE.

When there is occasion to indicate the degree of temperature, the scale of the centigrade thermometer, or, in its absence, that of Fahrenheit's thermometer, is to be employed. (See the tables on pages 526-530.)

By the term *gentle* heat is meant any temperature between 32° and 38° C. (about 90° to 100° F.).

In accordance with the prevailing usage of modern chemical literature, 15° C. (59° F.) has been adopted as the standard temperature for the solubility of substances in liquids, for taking specific gravity, and for volumetric operations. In the case of alcohol and wine, however, the temperature of 60° F. (15.667° C.) has been, for the present, retained, since all the laws and regulations of the United States, referring to alcohol and alcoholic liquids in general, are still based on this degree of temperature.

When a liquid is directed to be freed from alcohol or other volatile menstruum, at a limited temperature (as, for instance, in the preparation of extracts), the evaporation may be conducted with greater economy and less risk of injuring the product, by using a vacuum-apparatus of suitable construction.

WEIGHTS AND MEASURES.

Weight and volume in this Pharmacopœia are expressed in the units of the international system based on the Meter. In cases where only relative quantities are stated, the proportions are expressed in *parts by weight, or by volume*.

All weights and measures used in this country are now (1893) derived from the United States National Prototype Standards of the Meter and the Kilogramme, made of platinum-iridium, received by the United States Government from The International Bureau of Weights and Measures in 1890, and placed in the custody of the Office of Standard Weights and Measures at Washington.

The value of the United States National Prototype Standard Meter is identical with that of the International Standard Meter derived from the *Mètre des Archives*; and the United States National Prototype Standard Kilogramme, like the International Standard Kilogramme, is derived from the *Kilogramme des Archives*.

The actual Liter is the volume of one Kilogramme of pure water at the temperature of its maximum density, *in vacuo*. Theoretically the Liter is equal to one cubic decimeter, or 1000 cubic centimeters.

The United States *yard* is defined to be equal to $\frac{360000}{393700}$ meter; the commercial *pound* (Avoirdupois) is defined as being equal to $\frac{700000000}{1543235639}$ Kilogramme; and the liquid *gallon* is the volume of 3785.434 Grammes (58418.1444 grains) of water at the temperature of its maximum density, weighed *in vacuo*.*

THE UNITS OF THE METRIC SYSTEM.

Linear Measure:

The METER is equal to 10 decimeters, or to 100 centimeters, or to 1000 millimeters.

When abbreviated, the term centimeter is written Cm., and the term millimeter Mm.

Measures of Capacity:

The LITER is equal to 10 deciliters, or to 100 centiliters, or to 1000 milliliters.

The terms milliliter, centiliter, and deciliter are rarely used; but the term cubic centimeter is generally employed to designate the one-thousandth part of the liter. The term cubic centimeter, wherever referred to in this Pharmacopœia, is accordingly to be understood as synonymous with the term milliliter, and, when abbreviated, it is written Cc.

Measures of Weight:

The KILOGRAMME is equal to 1000 grammes.

The GRAMME is equal to 10 decigrammes, or to 100 centigrammes, or to 1000 milligrammes.

When abbreviated, the term gramme is written Gm.

In expressing quantities by weight or by measure, in writing, in terms of the Metric System, the common or Arabic numerals are

* While the liquid gallon of the United States is designed to be a volume of 231 cubic inches, it is determined or adjusted by weight on the assumption that 252.892 grains of water, at its maximum density, weighed *in vacuo*, measure one cubic inch. If the theoretical kilogramme (the weight of one cubic decimeter of water at its maximum density, *in vacuo*) and the actual International Standard Kilogramme (the equivalent of which in terms of English weight is 15432.35639 grains) are identical values, then, as 39.370 inches equal one Meter, the weight of a cubic inch of water at its maximum density, *in vacuo*, is 252.892 grains, and from this value the weight of 231 cubic inches of water at its maximum density, *in vacuo*, is found. These values are those employed by the Office of Standard Weights and Measures of the United States.

used, and are always placed before the terms or abbreviations designating the units, thus : 10 millimeters ; 2.50 Gm. ; 30 Cc.

OTHER WEIGHTS AND MEASURES.

The weights and measures *referred to by physicians in prescribing, and used by pharmacists in dispensing medicines*, are, in the United States, the Apothecaries' Weights and Fluid Measures, and those of the Metric System.

The Apothecaries' Weights and Fluid Measures used in the United States are the same as those used in England prior to 1825, the weights being originally derived from the Old English Troy Weight, and the Fluid Measures from the Wine Measure.

Apothecaries' Weight.

The APOTHECARIES' OUNCE (of the same value as the now obsolete English Troy ounce) is subdivided as follows :

1 Ounce is equal to 8 drachms, or to 480 grains.

1 Drachm is equal to 3 scruples, or to 60 grains.

1 Scruple is equal to 20 grains.

The Apothecaries' grain is identical in value with the Troy grain, the American commercial grain, and the grain of the British Imperial System.

The signs used by physicians in designating units of Apothecaries' Weight are : gr. (which should always be written with a *small* initial), denoting grain or grains ; \mathfrak{D} , denoting scruple or scruples ; \mathfrak{z} , denoting drachm or drachms ; and \mathfrak{z} , denoting ounce or ounces.

The numerals indicating the number of weight-units to be taken are, when Apothecaries' Weight is employed, always to be placed *after* the sign or symbol designating the unit, and in Roman characters, thus : gr. x ; \mathfrak{D} ij ; \mathfrak{z} iss ; \mathfrak{z} vj.

Apothecaries' Fluid Measure.

The Apothecaries' Fluid Measures are derived from the Liquid Gallon in use in the United States.

The Liquid Pint is identical in value with the Apothecaries' Pint, which is subdivided into 16 fluidounces.

The fluidounce contains 8 fluidrachms, or 480 minims, the fluidrachm containing 60 minims.

The signs used to designate these units are : \mathfrak{m} , denoting minim or minims ; \mathfrak{fz} , denoting fluidrachm or fluidrachms ; and \mathfrak{fz} , denoting fluidounce or fluidounces.

The quantities directed to be taken are indicated, in writing, by *Roman* numerals placed *after* the signs, as in using Apothecaries' Weight, thus: \mathfrak{m}_{xxx} ; $\mathfrak{f}\mathfrak{3}\mathfrak{i}\mathfrak{v}$; $\mathfrak{f}\mathfrak{3}\mathfrak{v}\mathfrak{i}\mathfrak{i}\mathfrak{j}$.

Customary Commercial Weights and Measures of Capacity in use in
the United States.

The commercial weights are :

The Pound (also called the Avoirdupois Pound), divided into 16 ounces, or into 7000 grains, each ounce thus containing 437.5 grains.

The commercial measures of capacity for liquids are :

The Liquid Gallon (also called the Wine Gallon), divided into 4 quarts, or 8 pints.

Relations between the various Units of Weights and Measures in use.

1 Meter is equal to 39.3700 Inches.

1 Yard is equal to 0.914402 Meter.

1 Liter is equal to 0.264170467 Liquid Gallon.

1 Liquid Gallon is equal to 3.785434 Liters.

1 Fluidounce is equal to 29.5737 Milliliters or Cubic Centimeters.

1 Kilogramme is equal to 2.20462 Pounds, or to 15432.35639 Grains.

1 Pound is equal to 453.5924277 Grammes.

1 Commercial (Avoirdupois) Ounce is equal to 28.3495 Grammes.

1 Apothecaries' Ounce is equal to 31.10348 Grammes.

1 Grain is equal to 64.7989 Milligrammes.

Comparisons of Weight and Volume.

At maximum density, in vacuo,

1 Liter of Water weighs 1 Kilogramme.

1 Gallon of Water weighs 3785.434 Grammes, or 58418.1444 Grains.

1 Fluidounce of Water weighs 29.5737 Grammes, or 456.392 Grains.

1 Apothecaries' Ounce of Water measures 31.10348 Milliliters or Cubic Centimeters, or 504.829 Minims.

LIST OF ARTICLES ADDED TO THE PHARMACOPOEIA.

Acetanilidum.	Extractum Scoparii Fluidum.
Acidum Hypophosphorosum Dilutum.	“ Uvæ Ursi.
“ Stearicum.	“ Viburni Opuli Fluidum.
Adeps Lanæ Hydrosus.	Ferri et Quininæ Citras Solubilis.
Alcohol Absolutum.	Glyceritum Acidi Carbolici.
“ Deodoratum.	“ Acidi Tannici.
Aloe Barbadosensis.	“ Boroglycerini.
Aloinum.	“ Hydrastis.
Aqua Aurantii Florum (diluted).	Hydrastininæ Hydrochloras.
“ Chloroformi.	Hyoscinæ Hydrobromas.
“ Hydrogenii Dioxidi.	Hyoscyaminæ Hydrobromas.
“ Rosæ (diluted).	Lithii Citras Effervescens.
Aspidosperma.	Menthol.
Barii Dioxidum.	Methyl Salicylas.
Caffeina Citrata.	Naphtalinum.
Caffeina Citrata Effervescens.	Naphtol.
Calcii Sulphas Exsiccatus.	Oleatum Zinci.
Cinnamomum Saigonicum.	Oleum Betulæ Volatile.
Cocainæ Hydrochloras.	“ Cadinum.
Convallaria.	“ Terebinthinæ Rectificatum.
Elastica.	Pancreatinum.
Elixir Aromaticum.	Paraldehydum.
“ Phosphori.	Pepsinum.
Eriodictyon.	Petrolatum Liquidum.
Eucalyptol.	“ Spissum.
Extractum Apocyni Fluidum.	Physostigminæ Sulphas.
“ Asclepiadis Fluidum.	Pilulæ Catharticæ Vegetabiles.
“ Aspidospermatis Fluidum.	“ Ferri Carbonatis.
“ Cimicifugæ.	Potassii Citras Effervescens.
“ Convallariæ Fluidum.	Pyrogallol.
“ Eriodictyi Fluidum.	Resorcinum.
“ Jalapæ.	Rhannus Purshiana.
“ Lappæ Fluidum.	Salol.
“ Menispermis Fluidum.	Sodii Nitris.
“ Phytolacæ Radicis Fluidum.	Sparteinae Sulphas.
“ Rhanni Purshianæ Fluidum.	Spiritus Amygdalæ Amaræ.

Spiritus Aurantii Compositus.

“ Glonoini.

“ Phosphori.

Strontii Bromidum.

“ Iodidum.

“ Lactas.

Strophanthus.

Suppositoria Glycerini.

Terebenum.

Terpini Hydras.

Tinctura Lactucarii.

“ Quillajæ.

“ Strophanthi.

Trochisci Santonini.

Viburnum Opulus.

Zea.

NOTE.—“Cinnamomum” of the Pharmacopœia of 1880 is represented in that of 1890 by two separate titles,—viz., Cinnamomum Cassia and Cinnamomum Zeylanicum. “Petrolatum Spissum” of the Pharmacopœia of 1890 was comprised under the title “Petrolatum” in that of 1880.

LIST OF ARTICLES DISMISSED FROM THE PHARMACOPOEIA.

Abstractum Aconiti.

“ Belladonnæ.

“ Conii.

“ Digitalis.

“ Hyoscyami.

“ Ignatiæ.

“ Jalapæ.

“ Nucis Vomicae.

“ Podophylli.

“ Senegæ.

“ Valerianæ.

Acetum Lobeliæ.

“ Sanguinariæ.

Æther.

Ammonii Phosphas.

“ Sulphas.

Amylum Iodatum.

Aurantii Flores.

Azedarach.

Cannabis Americana.

Ceratum Extracti Cantharidis.

“ Sabinæ.

Charta Cantharidis.

Chinoidinum.

Chloroformum Venale.

Cinchona Flava.

Cornus.

Cupri Acetas.

Cydonium.

Elixir Aurantii.

Emplastrum Ammoniæ.

“ Asafœtidæ.

“ Galbani.

“ Picis Canadensis.

Extractum Cornus Fluidum.

“ Lactucarii Fluidum.

d

Extractum Malti.

“ Mezerei.

Fel Bovis Inspissatum.

Ferri Oxalas.

Galbanum.

Gaultheria.

Gutta-Percha.

Hydrargyri Sulphidum Rubrum.

Ignatia.

Infusum Brayeræ.

Juniperus.

Lavandula.

Linimentum Cantharidis.

“ Plumbi Subacetatis.

Liquor Ferri et Quininæ Citratis.

“ Gutta-Perchæ.

“ Pepsini.

Magnesii Sulphis.

Magnolia.

Maltum.

Mistura Magnesiae et Asafœtidæ.

“ Potassii Citratis.

Mucilago Cydonii.

Oleum Lavandulæ.

“ Rutæ.

“ Succini.

“ Valerianæ.

Origanum.

Pilulæ Ferri Compositæ.

“ Galbani Compositæ.

Pix Canadensis.

Potassii Sulphis.

“ Tartaras.

Prinos.

Rosmarinus.

Salix.

1 LIST OF ARTICLES DISMISSED FROM THE PHARMACOPŒIA.

Sodii Bicarbonas Venalis.

“ Santoninas.

Spiritus Odoratus.

Syrupus Ferri Bromidi.

“ Limonis.

Thuja.

Tinctura Conii.

“ Ferri Acetatis.

“ Ignatiæ.

Trochisci Magnesiae.

Trochisci Sodii Santoninatis.

Unguentum Acidi Gallici.

“ Mezerei.

“ Sulphuris Alkalinum.

Ustilago.

Vinum Album Fortius.

“ Aloes.

“ Aromaticum.

“ Rhei.

Viola Tricolor.

LIST OF CHANGES OF OFFICIAL LATIN TITLES.

Pharmacopœia 1880.

Pharmacopœia 1890.

Acidum Arseniosum.....	Acidum Arsenosum.
Æther Fortior	Æther.
Aloe	Aloe Socotrina.
Aluminii Hydras.....	Alumini Hydras.
“ Sulphas	“ Sulphas.
Aqua Aurantii Florum	Aqua Aurantii Florum Fortior.
“ Creasoti.....	“ Creosoti.
“ Rosæ	“ Rosæ Fortior.
Arsenii Iodidum	Arseni Iodidum.
Brayera	Cusso.
Carbonei Bisulphidum	Carbonei Disulphidum.
Chloroformum Purificatum	Chloroformum.
Cinnamomum	Cinnamomum Cassia.
“	“ Zeylanicum.
Collodium cum Cantharide	Collodium Cantharidatum.
Creasotum.....	Creosotum.
Erythroxyton.....	Coca.
Emplastrum Picis cum Cantharide	Emplastrum Picis Cantharidatum.
Extractum Aloes Aquosum	Extractum Aloes.
“ Belladonnæ Alcoholicum ...	“ Belladonnæ Foliorum Alco- holicum.
“ Belladonnæ Fluidum	“ Belladonnæ Radicis Fluidum.
“ Brayeræ Fluidum	“ Cusso Fluidum.
“ Conii Alcoholicum	“ Conii.
“ Erythroxyli Fluidum	“ Cocæ Fluidum.
“ Hyoscyami Alcoholicum	“ Hyoscyami.
“ Sarsaparillæ Compositum Fluidum.....	“ Sarsaparillæ Fluidum Com- positum.
“ Stramonii	“ Stramonii Seminis.
“ Stramonii Fluidum.....	“ Stramonii Seminis Fluidum.
“ Viburni Fluidum.....	“ Viburni Prunifolii Fluidum.
Ferri Phosphas	Ferri Phosphas Solubilis.
“ Pyrophosphas	“ Pyrophosphas Solubilis.
“ Sulphas Præcipitatus.....	“ Sulphas Granulatus.
Gossypium	Gossypium Purificatum.
Hydrargyri Iodidum Viride	Hydrargyri Iodidum Flavum.

Pharmacopœia 1880.	Pharmacopœia 1890.
Liquor Acidi Arseniosi	Liquor Acidi Arsenosi.
“ Arsenii et Hydrargyri Iodidi....	“ Arseni et Hydrargyri Iodii.
“ Sodii Arseniatis	“ Sodii Arsenatis.
Magnesi Citras Granulatus	Magnesi Citras Effervescens.
Mangani Oxidum Nigrum	Mangani Dioxidum.
Mistura Ammoniaci	Emulum Ammoniaci.
“ Amygdalæ	“ Amygdalæ.
“ Asafœtidæ	“ Asafœtidæ.
“ Chloroformi	“ Chloroformi.
“ Ferri et Ammonii Acetatis.....	Liquor Ferri et Ammonii Acetatis.
Oleum Bergamii	Oleum Bergamottæ.
“ Theobromæ	“ Theobromatis.
Opium Denarcotisatum	Opium Deodoratum.
Petrolatum	Petrolatum Molle, and P. Spissum.
Phytolaccæ Bacca	Phytolaccæ Fructus.
Piperina	Piperinum.
Quillaia	Quillaja.
Sapo Viridis	Sapo Mollis.
Sodii Arsenias	Sodii Arsenas.
Tinctura Belladonnæ	Tinctura Belladonnæ Foliorum.
“ Colchici	“ Colchici Seminis.
“ Opii Deodorata	“ Opii Deodorati.
“ Saponis Viridis	Linimentum Saponis Mollis.
“ Stramonii	Tinctura Stramonii Seminis.
Viburnum	Viburnum Prunifolium.

LIST OF CHANGES OF OFFICIAL ENGLISH TITLES.

Pharmacopœia 1880.

Pharmacopœia 1890.

Acetate of Lead.....	Lead Acetate.
“ “ Morphine.....	Morphine Acetate.
“ “ Potassium.....	Potassium “
“ “ Sodium.....	Sodium “
“ “ Zinc.....	Zinc “
Alcoholic Extract of Belladonna.....	Alcoholic Extract of Belladonna Leaves.
“ “ “ Conium.....	Extract of Conium.
“ “ “ Hyoscyamus.....	“ “ Hyoscyamus.
Almond Mixture.....	Emulsion of Almond.
Aloes.....	Socotrine Aloes.
Ammoniac Mixture.....	Emulsion of Ammoniac.
Aqueous Extract of Aloes.....	Extract of Aloes.
Arsenate of Sodium.....	Sodium Arsenate.
Arsenious Acid.....	Arsenous Acid.
Asafetida Mixture.....	Emulsion of Asafetida.
Benzoate of Ammonium.....	Ammonium Benzoate.
“ “ Lithium.....	Lithium “
“ “ Sodium.....	Sodium “
Bicarbonate of Potassium.....	Potassium Bicarbonate.
“ “ Sodium.....	Sodium “
Bichromate of Potassium.....	Potassium Bichromate.
Bisulphate of Quinine.....	Quinine Bisulphate.
Bisulphide of Carbon.....	Carbon Disulphide.
Bisulphite of Sodium.....	Sodium Bisulphite.
Bitartrate of Potassium.....	Potassium Bitartrate.
Black Oxide of Manganese.....	Manganese Dioxide.
Borate of Sodium.....	Sodium Borate.
Brayera.....	Kousso.
Bromide of Ammonium.....	Ammonium Bromide.
“ “ Calcium.....	Calcium “
“ “ Lithium.....	Lithium “
“ “ Potassium.....	Potassium “
“ “ Sodium.....	Sodium “
“ “ Zinc.....	Zinc “
Carbonate of Ammonium.....	Ammonium Carbonate.
“ “ Lead.....	Lead “
“ “ Lithium.....	Lithium “
“ “ Magnesium.....	Magnesium “
“ “ Potassium.....	Potassium “
“ “ Sodium.....	Sodium “

Pharmacopœia 1880.	Pharmacopœia 1890.
Cerate of Subacetate of Lead	Cerate of Lead Subacetate.
Chlorate of Potassium	Potassium Chlorate.
“ “ Sodium	Sodium “
Chloride of Ammonium	Ammonium Chloride.
“ “ Calcium	Calcium “
“ “ Gold and Sodium	Gold and Sodium Chloride.
“ “ Iron	Ferric Chloride.
“ “ Sodium	Sodium “
“ “ Zinc	Zinc “
Chloroform Mixture	Emulsion of Chloroform.
Cinnamon	{ Cassia Cinnamon. Ceylon Cinnamon.
Citrate of Bismuth	Bismuth Citrate.
“ “ Bismuth and Ammonium	Bismuth and Ammonium Citrate.
“ “ Iron	Ferric Citrate.
“ “ Iron and Ammonium	Iron and Ammonium Citrate.
“ “ Iron and Quinine	Iron and Quinine “
“ “ Iron and Strychnine	Iron and Strychnine “
“ “ Lithium	Lithium Citrate.
“ “ Potassium	Potassium “
Collodion with Cantharides	Cantharidal Collodion.
Corrosive Chloride of Mercury	Corrosive Mercuric Chloride.
Cotton	Purified Cotton.
Creasote	Creosote.
Creasote Water	Creosote Water.
Cyanide of Mercury	Mercuric Cyanide.
“ “ Potassium	Potassium “
“ “ Silver	Silver “
Denarcotized Opium	Deodorized Opium.
Deodorized Tincture of Opium	Tincture of Deodorized Opium.
Diluted Nitrate of Silver	Diluted Silver Nitrate.
“ Solution of Subacetate of Lead ..	“ Solution of Lead Subacetate.
Dried Carbonate of Sodium	Dried Sodium Carbonate.
“ Sulphate of Iron	Dried Ferrous Sulphate.
Erythroxylon	Coca.
Extract of Stramonium	Extract of Stramonium Seed.
Ferrocyanide of Potassium	Potassium Ferrocyanide.
Flaxseed	Linseed.
Fluid Extract of Belladonna	Fluid Extract of Belladonna Root.
“ “ “ Brayera	“ “ “ Kousso.
“ “ “ Cotton Root	“ “ “ Cotton Root Bark.
“ “ “ Erythroxylon	“ “ “ Coca.
“ “ “ Stramonium	“ “ “ Stramonium Seed.
“ “ “ Viburnum	“ “ “ Viburnum Prunifolium.
Granulated Citrate of Magnesium	Effervescent Magnesium Citrate.
Green Iodide of Mercury	Yellow Mercurous Iodide.
Green Soap	Soft Soap.

Pharmacopœia 1880.	Pharmacopœia 1890.
Hydrated Oxide of Iron.....	Ferric Hydrate.
“ “ “ Iron with Magnesia	Ferric Hydrate with Magnesia.
Hydrate of Aluminium.....	Aluminum Hydrate.
Hydrobromate of Quinine.....	Quinine Hydrobromate.
Hydrochlorate of Apomorphine.....	Apomorphine Hydrochlorate.
“ “ Morphine	Morphine “
“ “ Pilocarpine.....	Pilocarpine “
“ “ Quinine.....	Quinine “
Hypophosphite of Calcium	Calcium Hypophosphite.
“ “ Iron.....	Ferric “
“ “ Potassium	Potassium “
“ “ Sodium.....	Sodium “
Hyposulphite of Sodium	Sodium Hyposulphite.
Iodide of Ammonium	Ammonium Iodide.
“ “ Arsenic	Arsenic “
“ “ Lead	Lead “
“ “ Potassium.....	Potassium “
“ “ Silver.....	Silver “
“ “ Sodium	Sodium “
“ “ Sulphur.....	Sulphur “
“ “ Zinc	Zinc “
Lactate of Iron	Ferrous Lactate.
Mass of Carbonate of Iron.....	Mass of Ferrous Carbonate.
Mild Chloride of Mercury	Mild Mercurous Chloride.
Mixture of Acetate of Iron and Ammonium	Solution of Iron and Ammonium Acetate.
Moulded Nitrate of Silver	Moulded Silver Nitrate.
Nitrate of Ammonium.....	Ammonium Nitrate.
“ “ Lead	Lead “
“ “ Potassium	Potassium “
“ “ Potassium Paper.....	Potassium Nitrate Paper.
“ “ Silver	Silver Nitrate.
“ “ Sodium.....	Sodium “
Nitrite of Amyl.....	Amyl Nitrite.
Oil of Flaxseed	Linseed Oil.
Ointment of Iodide of Lead	Ointment of Lead Iodide.
“ “ Iodide of Potassium	“ “ Potassium Iodide.
“ “ Carbonate of Lead.....	“ “ Lead Carbonate.
“ “ Nitrate of Mercury	“ “ Mercuric Nitrate.
“ “ Oxide of Zinc	“ “ Zinc Oxide.
“ “ Red Oxide of Mercury....	“ “ Red Mercuric Oxide.
“ “ Yellow Oxide of Mercury..	“ “ Yellow Mercuric Oxide.
Orange Flower Water	Stronger Orange Flower Water.
Oxalate of Cerium	Cerium Oxalate.
Oxide of Antimony	Antimony Oxide.
“ “ Lead	Lead “
“ “ Silver.....	Silver “

Pharmacopœia 1880.	Pharmacopœia 1890.
Oxide of Zinc.....	Zinc Oxide.
Permanganate of Potassium.....	Potassium Permanganate.
Petrolatum.....	Soft Petrolatum. Hard Petrolatum.
Phosphate of Iron.....	Soluble Ferric Phosphate.
“ “ Sodium.....	Sodium Phosphate.
Phosphide of Zinc.....	Zinc Phosphide.
Phytolacca Berry.....	Phytolacca Fruit.
Pills of Iodide of Iron.....	Pills of Ferrous Iodide.
Piperine.....	Piperin.
Pitch Plaster with Cantharides.....	Cantharidal Pitch Plaster.
Precipitated Carbonate of Calcium.....	Precipitated Calcium Carbonate.
“ Carbonate of Zinc.....	“ Zinc Carbonate.
“ Phosphate of Calcium.....	“ Calcium Phosphate.
“ Sulphate of Iron.....	“ Ferrous Sulphate.
Purified Chloroform.....	Chloroform.
Pyrophosphate of Iron.....	Soluble Ferric Pyrophosphate.
“ “ Sodium.....	Sodium Pyrophosphate.
Quillaia.....	Quillaja.
Red Iodide of Mercury.....	Red Mercuric Iodide.
“ Oxide of Mercury.....	“ “ Oxide.
Rose Water.....	Stronger Rose Water.
Saccharated Carbonate of Iron.....	Saccharated Ferrous Carbonate.
“ Iodide of Iron.....	“ “ Iodide.
Salicylate of Lithium.....	Lithium Salicylate.
“ “ Physostigmine.....	Physostigmine Salicylate.
“ “ Sodium.....	Sodium “
Subcarbonate of Bismuth.....	Bismuth Subcarbonate.
Subnitrate of Bismuth.....	“ Subnitrate.
Solution of Acetate of Ammonium.....	Solution of Ammonium Acetate.
“ “ Acetate of Iron.....	“ “ Ferric Acetate.
“ “ Arseniate of Sodium.....	“ “ Sodium Arsenate.
“ “ Arsenious Acid.....	“ “ Arsenous Acid.
“ “ Arsenite of Potassium.....	“ “ Potassium Arsenite.
“ “ Chloride of Iron.....	“ “ Ferric Chloride.
“ “ Chloride of Zinc.....	“ “ Zinc Chloride.
“ “ Citrate of Iron.....	“ “ Ferric Citrate.
“ “ Citrate of Magnesium.....	“ “ Magnesium Citrate.
“ “ Citrate of Potassium.....	“ “ Potassium “
“ “ Nitrate of Iron.....	“ “ Ferric Nitrate.
“ “ Nitrate of Mercury.....	“ “ Mercuric Nitrate.
“ “ Iodide of Arsenic and Mer- cury.....	“ “ Arsenic and Mercuric Iodide.
“ “ Silicate of Sodium.....	“ “ Sodium Silicate.
“ “ Subacetate of Lead.....	“ “ Lead Subacetate.
“ “ Subsulphate of Iron.....	“ “ Ferric Subsulphate.
“ “ Tersulphate of Iron.....	“ “ Ferric Tersulphate.

Pharmacopœia 1880.	Pharmacopœia 1890.
Stronger Ether	Ether.
“ Water of Ammonia	Stronger Ammonia Water.
Sulphate of Aluminium	Aluminum Sulphate.
“ “ Atropine	Atropine “
“ “ Cinchonidine	Cinchonidine “
“ “ Cinchonine	Cinchonine “
“ “ Copper	Copper “
“ “ Hyoscyamine	Hyoscyamine “
“ “ Iron	Ferrous “
“ “ Iron and Ammonium	Ferric Ammonium Sulphate.
“ “ Magnesium	Magnesium Sulphate.
“ “ Manganese	Manganese “
“ “ Morphine	Morphine “
“ “ Potassium	Potassium “
“ “ Quinidine	Quinidine “
“ “ Quinine	Quinine “
“ “ Sodium	Sodium “
“ “ Strychnine	Strychnine “
“ “ Zinc	Zinc “
Sulphide of Antimony	Antimony Sulphide.
Sulphite of Sodium	Sodium Sulphite.
Sulphocarbolate of Sodium	“ Sulphocarbolate.
Syrup of Iodide of Iron	Syrup of Ferrous Iodide.
“ “ Lactophosphate of Calcium ...	“ “ Calcium Lactophosphate.
Tartrate of Antimony and Potassium ...	Antimony and Potassium Tartrate.
“ “ Iron and Ammonium	Iron and Ammonium “
“ “ Iron and Potassium	Iron and Potassium “
“ “ Potassium and Sodium	Potassium and Sodium “
Tincture of Belladonna	Tincture of Belladonna Leaves.
“ “ Chloride of Iron	“ “ Ferric Chloride.
“ “ Colchicum	“ “ Colchicum Seed.
“ “ Green Soap	Liniment of Soft Soap.
“ “ Stramonium	Tincture of Stramonium Seed.
Troches of Bicarbonate of Sodium	Troches of Sodium Bicarbonate.
“ “ Chlorate of Potassium	“ “ Potassium Chlorate.
“ “ Chloride of Ammonium	“ “ Ammonium Chloride.
Valerianate of Ammonium	Ammonium Valerianate.
“ “ Iron	Ferric Valerianate.
“ “ Quinine	Quinine “
“ “ Zinc	Zinc “
Viburnum	Viburnum Prunifolium.
Water of Ammonia	Ammonia Water.
Wine of Citrate of Iron	Wine of Ferric Citrate.
Yellow Cinchona	Cinchona (in part).
“ Oxide of Mercury	Yellow Mercuric Oxide.
“ Subsulphate of Mercury	“ “ Subsulphate.

TABLE SHOWING THE STRENGTH OF THE MORE IMPORTANT PHARMACOPŒIAL PREPARATIONS IN THE PRESENT AND IN THE PRECEDING PHARMACOPŒIA.

NOTE.—The less important articles or preparations (Cerates, Ointments, Pills, Spirits, Syrups, Troches, etc.) are not noticed here. Of tinctures, only the more energetic ones are included. In the case of all other preparations intended for internal use, the strength directed by the present Pharmacopœia is practically the same as that directed by the preceding one.

Title of Article.	Chief Constituent.	Pharm. 1880.	Pharm. 1890.
Acetum Opii.....	Opium of 13 to 15% Morphine (cryst.)	1 Gm. in ab. 9 Cc.	1 Gm. in 10 Cc.
Acidum Nitricum.....	HNO ₃ , by weight.....	69.4%	68.0%
“ Phosphoricum.....	H ₃ PO ₄ , “.....	50.0%	at least 85.0%
“ Sulphuricum.....	H ₂ SO ₄ , “.....	at least 96.0%	at least 92.5%
“ Sulphurosum.....	SO ₂ , “.....	about 3.4%	at least 6.4%
Alcohol Dilutum.....	Absolute Alcohol, by weight.....	45.5%	about 41.0%
Calx Chlorata.....	Available Chlorine, by weight.....	at least 25.0%	at least 35.0%
“ Sulphurata.....	CaS, by weight.....	at least 36.0%	at least 60.0%
Decocta.....	Drug.....	about 1 in 10	about 1 in 20
Extractum Nucis Vomicae.....	Alkaloids, by weight.....	strength not fixed	15.0%
“ Nucis Vomicae Fluidum...	“ “ “.....	“ “ “	1.5 Gm. in 100 Cc.
“ Opii.....	Morphine (cryst.), by weight.....	“ “ “	18.0%
Infusa.....	Drug.....	about 1 in 10	about 1 in 20
Liquor Sodæ Chloratæ.....	Available Chlorine, by weight.....	at least 2%	at least 2.6%
Opii Pulvis.....	Morphine (cryst.), “.....	12 to 16%	13 to 15%
Opium (moist).....	“ “ “.....	at least 9%	at least 9%

Pepsinum	Digestive Power on Albumen	1 to 50		at least 1 to 3000
		1 Gm. in ab.	2.89 Cc.	at least 1 to 300
Tinctura Aconiti	Aconite	1	1 Gm. in ab.	1 Gm. in 2.86 Cc.
"	"	1	"	"
"	Belladonna Leaves	1	"	"
"	"	1	"	"
"	Cannabis Indica	1	"	"
"	"	1	"	"
"	Colchici Seminis	1	"	"
"	"	1	"	"
"	Cubebæ	1	"	"
"	"	1	"	"
"	Digitalis	1	"	"
"	"	1	"	"
"	Gelsemii	1	"	"
"	"	1	"	"
"	Hyoscyami	1	"	"
"	"	1	"	"
"	Iodi	1	"	"
"	"	1	"	"
"	Lobeliæ	1	"	"
"	"	1	"	"
"	Moschi	1	"	"
"	"	1	"	"
"	Nucis Vomiceæ	1	"	"
"	"	1	"	"
"	Opii	1	"	"
"	"	1	"	"
"	"	1	"	"
"	"	1	"	"
"	Physostigmatis	1	"	"
"	"	1	"	"
"	Stramonii Seminis	1	"	"
"	"	1	"	"
"	Veratri Viridis	1	"	"
Vinum Colchici Radicis	Colchicum Root.	1	"	"
"	"	1	"	"
"	Seed.	1	"	"
Ipecacuanhæ	Ipecac.	1	"	"
"	"	1	"	"
"	Opium of 13 to 15 % Morphine (cryst.)	1	"	"

NOTE.—Acetum Opii, Tinctura Opii, Tinctura Opii Deodorati, and Vinum Opii are required to yield, on being assayed, 1.3 to 1.5 % of crystallized morphine.

THE PHARMACOPŒIA

OF THE

UNITED STATES OF AMERICA.

THE PHARMACOPŒIA

OF THE

UNITED STATES OF AMERICA.

ABSINTHIUM.

ABSINTHIUM.

[WORMWOOD.]

The leaves and tops of *Artemisia Absinthium* Linné (nat. ord. *Compositæ*).

Leaves about 5 Cm. long, hoary, silky-pubescent, petiolate, roundish-triangular in outline ; pinnately two- or three-cleft, with the segments lanceolate, the terminal one spatulate ; bracts three-cleft or entire ; heads numerous, about 3 Mm. long, subglobose, with numerous small, pale yellow florets, all tubular and without pappus ; odor aromatic ; taste persistently bitter.

ACACIA.

ACACIA.

[GUM ARABIC.]

A gummy exudation from *Acacia Senegal* Willdenow (nat. ord. *Leguminosæ*).

In roundish tears of various sizes, or broken into angular fragments, with a glass-like, sometimes iridescent fracture, opaque from numerous fissures, but transparent and nearly colorless in thin pieces ; nearly inodorous ; taste insipid, mucilaginous ; insoluble in alcohol, but soluble in water, forming a thick, mucilaginous liquid.

Acacia should be slowly but completely soluble in 2 parts of water. This solution shows an acid reaction with litmus paper, yields a gelatinous precipitate with basic lead acetate T.S., ferric chloride T.S., or concentrated solution of sodium borate, and does not reduce alkaline cupric tartrate V.S.

The powder is not colored blue (absence of *starch*), or red (absence of *dextrin*), by iodine T.S.

Preparations : Mucilago Acaciæ. Pulvis Cretæ Compositus.

ACETANILIDUM.

ACETANILID.



[PHENYLACETAMIDE.]

An acetyl derivative of aniline.

White, shining, micaceous, crystalline laminae, or a crystalline powder, odorless, having a faintly burning taste, and permanent in the air.

Soluble, at 15° C. (59° F.), in 194 parts of water, and in 5 parts of alcohol; in 18 parts of boiling water, and in 0.4 part of boiling alcohol; also soluble in 18 parts of ether, and easily soluble in chloroform.

When heated to 113° C. (235.4° F.), Acetanilid melts. Upon ignition, it is consumed without leaving a residue.

Acetanilid is neutral to litmus paper.

When agitated with colorless, concentrated sulphuric acid, in a clean test-tube, Acetanilid dissolves without imparting color to the liquid.

On heating about 0.1 Gm. of Acetanilid with a few Cc. of concentrated solution (1 in 4) of potassium or sodium hydrate, the characteristic odor of aniline becomes noticeable. On now adding chloroform, and again heating, the disagreeable odor of phenyl isocyanide (which is poisonous) is evolved.

On boiling 0.1 Gm. of Acetanilid for several minutes with 2 Cc. of hydrochloric acid, a clear solution results which, when mixed with 3 Cc. of a 5-per-cent. aqueous solution of carbolic acid, and afterwards with 5 Cc. of a filtered, saturated solution of chlorinated lime (*Calx chlorata*), acquires a brownish-red color, becoming blue upon supersaturation with ammonia.

A cold saturated, aqueous solution of Acetanilid, added to ferric chloride T.S., should not affect the color of the latter (absence of *aniline salts* and *various allied substances*).

ACETUM OPII.

VINEGAR OF OPIUM.

Powdered Opium, <i>one hundred grammes</i>	100 Gm.
Nutmeg, in No. 30 powder, <i>thirty grammes</i>	30 Gm.
Sugar, <i>two hundred grammes</i>	200 Gm.
Diluted Acetic Acid, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Macerate the Opium and Nutmeg in *five hundred (500) cubic centimeters* of Diluted Acetic Acid during seven days, frequently stirring; then strain through muslin of close texture, and express the liquid. Mix the residue with *two hundred (200) cubic centimeters* of Diluted Acetic Acid to a uniform magma, and strain and express again. Mix and filter the strained liquids, dissolve the Sugar in the filtrate, and pass enough Diluted Acetic Acid through the filter to make the product measure *one thousand (1000) cubic centimeters*.

To assay this preparation, transfer 100 Cc. of it to a small capsule, add 4 Gm. of precipitated calcium carbonate, or such a quantity as will be sufficient to neutralize the free acid, and then proceed further as directed under *Tinctura Opii*. It should yield from 1.3 to 1.5 Gm. of crystallized morphine.

ACETUM SCILLÆ.

VINEGAR OF SQUILL.

Squill, in No. 30 powder, *one hundred grammes* 100 Gm.

Diluted Acetic Acid, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Macerate the Squill with *nine hundred (900) cubic centimeters* of Diluted Acetic Acid during seven days, frequently stirring; then strain through muslin, and wash the mass on the strainer with enough Diluted Acetic Acid, until the strained liquid measures *one thousand (1000) cubic centimeters*. Finally filter.

ACIDUM ACETICUM.

ACETIC ACID.

A liquid composed of 36 per cent., by weight, of absolute Acetic Acid [$\text{HC}_2\text{H}_3\text{O}_2 = 59.86$], and 64 per cent. of water.

A clear, colorless liquid, having a strong, vinegar-like odor, a purely acid taste, and a strongly acid reaction.

Specific gravity: about 1.048 at 15° C. (59° F.).

Miscible with water or alcohol in all proportions.

When heated, the Acid is volatilized without leaving a residue.

On adding to Acetic Acid enough ammonia water to neutralize it or to leave the Acid in slight excess, and then adding ferric chloride T.S., the liquid will acquire a blood-red color, which is discharged by strongly acidulating with sulphuric acid.

When the Acid is slightly supersaturated with ammonia, the liquid should not have a bluish tint (absence of *copper*), nor should any residue be left after evaporating the alkaline liquid on the water-bath (absence of *other fixed impurities*).

Acetic Acid diluted with 20 volumes of water should neither become colored nor yield a precipitate with hydrogen sulphide T.S. (absence of *lead, copper, etc.*).

Acetic Acid diluted with 10 volumes of water should not yield a precipitate or turbidity with barium chloride T.S. (absence of *sulphuric acid*), or with silver nitrate T.S. (absence of *hydrochloric acid*).

If a portion of the Acid be just neutralized by ammonia, then mixed with some silver nitrate T.S., and warmed, the liquid should not turn dark-colored or deposit a dark-colored precipitate (absence of *formic or sulphurous acid*).

When the Acid is slightly supersaturated by sodium or potassium hydrate T.S., the liquid should not have a smoky odor or taste. And if 5 drops of decinormal potassium permanganate V.S. be mixed with 2 Cc. of the Acid previously diluted with 10 Cc. of water, and contained in a clean, glass-stoppered vial, the pink tint should not change at once to brown, but should change only gradually, and not become entirely brown, or free from pinkish-brown, in less than half a minute (limit of *emphyreumatic substances*).

To neutralize 6 Gm. of Acetic Acid should require 36 Cc. of normal potassium hydrate V.S. (each Cc. corresponding to 1 per cent. of the absolute acid), phenolphthalein being used as indicator.

Preparation: Acidum Aceticum Dilutum.

ACIDUM ACETICUM DILUTUM.**DILUTED ACETIC ACID.**

Acetic Acid, *one hundred grammes*..... 100 Gm.

Distilled Water, *five hundred grammes*..... 500 Gm.

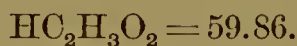
To make *six hundred grammes*.... 600 Gm.

Mix them.

Diluted Acetic Acid contains 6 per cent., by weight, of absolute Acetic Acid. Specific gravity : about 1.008 at 15° C. (59° F.).

It corresponds, in properties, to Acetic Acid (see *Acidum Aceticum*), and should respond to the same tests of purity.

To neutralize 24 Gm. of Diluted Acetic Acid should require 24 Cc. of potassium hydrate V.S. (each Cc. corresponding to 0.25 per cent. of the absolute acid), phenolphthalein being used as indicator.

ACIDUM ACETICUM GLACIALE.**GLACIAL ACETIC ACID.**

Nearly or quite absolute Acetic Acid.

A clear, colorless liquid, of a strong, vinegar-like odor, and a very pungent, purely acid taste.

When the Acid is cooled to a temperature as near as possible to 15° C. (59° F.), but yet in a liquid form, its specific gravity should not be higher than 1.058, corresponding to at least 99 per cent. of absolute acid.

At a temperature somewhat below 15° C. (59° F.), the Acid becomes a crystalline solid. When crystallized by cold, it becomes liquid again at about 15° C. (59° F.). At 117° to 118° C. (242.6° to 244.4° F.) it boils, evolving inflammable vapors.

Glacial Acetic Acid corresponds in properties to Acetic Acid (see *Acidum Aceticum*), and should respond to the same tests of purity ; but the tint produced by the addition of 2 drops of decinormal potassium permanganate V.S. to 2 Cc. of the Acid diluted with 10 Cc. of water, contained in a clean, glass-stoppered vial, should not be changed to brown within two hours.

To neutralize 3 Gm. of Glacial Acetic Acid should require not less than 49.5 Cc. of potassium hydrate V.S. (each Cc. corresponding to 2 per cent. of the absolute acid), phenolphthalein being used as indicator.

ACIDUM ARSENOSUM.**ARSENOUS ACID.**

[ARSENIC TRIOXIDE. WHITE ARSENIC.]

A heavy solid, occurring either as an opaque, white powder, or in irregular masses of two varieties : the one amorphous, transparent and colorless, like glass ; the other crystalline, opaque or white, resembling porcelain. Frequently the same piece has an opaque, white, outer crust enclosing the glassy variety within. Contact with moist air gradually changes the glassy into the white, opaque variety. Both are odorless and tasteless.

In cold water both varieties dissolve very slowly, the glassy variety requiring about 30, the porcelain-like about 80 parts of water at 15° C. (59° F.). Both are slowly but completely soluble in 15 parts of boiling water. In alcohol, Arsenous Acid is but sparingly soluble, but it is soluble in about 5 parts of glycerin. Oil of turpentine dissolves only the glassy variety. Both varieties are freely soluble in hydrochloric acid, and in solutions of alkali hydrates and carbonates.

When heated to 218° C. (424.4° F.), Arsenous Acid is completely volatilized without melting. When thrown on ignited charcoal, it emits an alliaceous odor. When its vapor is passed through red-hot charcoal, in an arsenic-tube, it is deoxidized, and metallic arsenic is deposited on the cooler portion of the tube as a mirror having a metallic lustre.

An aqueous solution of Arsenous Acid has a faintly acid reaction upon litmus paper.

Silver ammonium nitrate T.S. produces in the solution a lemon-yellow precipitate, which dissolves on addition of ammonia water; when this solution is heated, metallic silver is deposited (distinction from *arsenic acid*).

Copper ammonium sulphate T.S. produces a bright green precipitate, which dissolves in ammonia water with a deep blue color.

Hydrogen sulphide T.S. colors the solution of Arsenous Acid yellow; if a few drops of hydrochloric acid are added, it precipitates lemon-yellow arsenic trisulphide, which should be completely soluble in ammonium carbonate T.S. (absence of *antimony*, *tin*, and *cadmium*).

When Arsenous Acid is carefully heated in a dry test-tube of hard glass, it should sublime without leaving a residue, and the sublimate should not at first show a yellow color (absence of *non-volatile matter* and of *arsenic sulphide*).

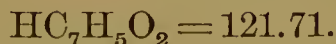
If 1 part of Arsenous Acid be dissolved in 10 parts of ammonia water, with the aid of a gentle heat, the solution should neither leave an *insoluble residue*, nor show a yellow or other *color*; nor should the addition of a slight excess of hydrochloric acid produce a precipitate (absence of *metallic impurities*, *sulphides*, etc.).

If 0.1 Gm. of Arsenous Acid be dissolved, together with 1 Gm. of sodium bicarbonate, in 20 Cc. of water by the aid of a gentle heat, it should decolorize not less than 20 Cc. of decinormal iodine V.S. (corresponding to at least 98.8 per cent. of Arsenic Trioxide).

Preparations: Liquor Acidi Arsenosi. Liquor Potassii Arsenitis.

ACIDUM BENZOICUM.

BENZOIC ACID.



An organic acid, usually obtained from benzoin by sublimation, or prepared artificially, chiefly from toluol.

It should be kept in dark amber-colored, well-stoppered bottles, in a cool place.

White, or yellowish-white, lustrous scales or friable needles, odorless, or having a slight, characteristic odor resembling that of benzoin, and of a warm, acid taste; somewhat volatile at a moderately warm temperature, and rendered darker by exposure to light.

Soluble, when pure, in about 500 parts of water, and in 2 parts of alcohol at 15° C. (59° F.); in 15 parts of boiling water, and in 1 part of boiling alcohol. Also soluble in 3 parts of ether, 7 parts of chloroform, and readily soluble in carbon disulphide, benzol, fixed and volatile oils, but sparingly soluble in benzin.

Benzoic Acid volatilizes freely with the vapor of water. On heating it to 100° C. (212° F.), it begins to sublime. At 121.4° C. (250.5° F.) it melts, and at a higher temperature it is consumed without leaving a residue.

The acid sublimed from benzoin has a lower melting point, and a greater solubility in water.

Benzoic Acid has an acid reaction.

On heating Benzoic Acid gradually, with 3 parts of freshly slaked lime, in a retort, benzol is evolved.

The Acid is freely soluble in solutions of alkali hydrates. On carefully neutralizing such a solution, and adding ferric chloride T.S., previously diluted with 2 volumes of water, and neutralized, if necessary, by ammonia, a flesh-colored precipitate of ferric benzoate is produced.

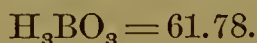
A solution of Benzoic Acid in pure, cold sulphuric acid, when gently warmed, should not turn darker than light brown; if it is then poured into water, the Benzoic Acid should separate as a white precipitate, and the liquid should be colorless (absence of *readily carbonizable, organic matters*).

If 0.5 Gm. of the Acid and 0.8 Gm. of calcium carbonate be mixed with a little water in a crucible, the mixture dried, gently ignited, and then dissolved in water, with the aid of nitric acid in slight excess, so as to obtain 20 Cc. of filtrate, the addition of silver nitrate T.S. to the latter should not produce much more opalescence (if at all) than is produced by the same reagent in a solution measuring 20 Cc. prepared by dissolving 0.8 Gm. of the same calcium carbonate in water with the aid of nitric acid (absence of more than traces of *chlorine*).

On warming 0.5 Gm. of the Acid with 5 Cc. of water and 0.5 Gm. of potassium permanganate in a test-tube loosely stoppered and placed in a water-bath heated to about 45° C. (113° F.), then tightly stoppering, and cooling the test-tube with cold water, upon removing the stopper, no odor of oil of bitter almond should be discernible (absence of *cinnamic acid*).

ACIDUM BORICUM.

BORIC ACID.



[BORACIC ACID.]

Transparent, colorless scales, of a somewhat pearly lustre, or, when in perfect crystals, six-sided, triclinic plates, slightly unctuous to the touch, odorless, having a faintly bitterish taste, and permanent in the air.

Soluble, at 15° C. (59° F.), in 25.6 parts of water, and in 15 parts of alcohol; also soluble in 10 parts of glycerin. Addition of hydrochloric acid increases its solubility in water.

When heated to 100° C. (212° F.), Boric Acid loses water, forming metaboric acid (HBO_2), which slowly volatilizes at that temperature.

Heated to 160° C. (320° F.), it fuses to a glassy mass of tetraboric (or pyroboric) acid ($\text{H}_2\text{B}_4\text{O}_7$); at a higher temperature the fused mass swells up, loses all of its water, and becomes boron trioxide (B_2O_3), which fuses into a transparent, non-volatile mass.

From a boiling solution, Boric Acid readily volatilizes.

The solution in alcohol or glycerin burns with a flame enveloped with a green-colored mantle.

An aqueous solution (1 in 50) of Boric Acid colors blue litmus paper red, but yellow turmeric paper brownish-red after drying, even when the solution had been acidulated with hydrochloric acid; this brownish-red color is changed to bluish-black by ammonia water.

A 2-per-cent. aqueous solution of the Acid should not be precipitated by barium chloride T.S. (absence of *sulphate*); silver nitrate T.S. with nitric acid (absence of *chloride*); ammonium sulphide T.S. (*lead, copper, iron, etc.*); ammonium oxalate T.S. (*calcium*); or sodium phosphate T.S. and ammonia water (*magnesium*).

No odor of *ammonia* should be evolved by heating the Acid with potassium or sodium hydrate T.S.

In a solution of 1 Gm. of Boric Acid in a mixture of 1 Cc. of hydrochloric acid and 49 Cc. of water, 0.5 Cc. of potassium ferrocyanide T.S. should not at once produce a blue color (limit of *iron*).

A fragment heated on a platinum wire (thoroughly cleansed by washing and heating, until it no longer colors the flame), should not impart to the non-luminous flame a persistent yellow color (absence of *sodium*).

Preparation: Glyceritum Boroglycerini.

ACIDUM CARBOLICUM.

CARBOLIC ACID.



[PHENOL.]

A constituent of coal-tar, obtained by fractional distillation, and subsequently purified.

Carbolic Acid should be kept in dark amber-colored, well-stoppered vials.

Colorless, interlaced, or separate, needle-shaped crystals, or a white, crystalline mass, sometimes acquiring a reddish tint; having a characteristic, somewhat aromatic odor, and, when copiously diluted with water, a sweetish taste with a slightly burning after-taste. Deliquescent on exposure to damp air.

Soluble, at 15° C. (59° F.), in about 15 parts of water, the solubility varying according to the degree of hydration of the acid. Very soluble in alcohol, ether, chloroform, benzol, carbon disulphide, glycerin, fixed and volatile oils. Almost insoluble in benzin.

When gently heated, Carbolic Acid melts, forming a highly refractive liquid. It is also liquefied by the addition of about 8 per cent. of water. If the Acid be liquefied by a gentle heat, and then slowly cooled, under constant stirring, until it is partly recrystallized, the semi-liquid mass should have a temperature (remaining stationary for a short time) not lower than 35° C. (95° F.).

The Acid should have a boiling point not higher than 188° C. (370.4° F.).

A lower boiling point, or a higher melting point, indicates a purer or less hydrated acid.

When heated upon a water-bath, the Acid should be volatilized without leaving a residue. The vapor of the Acid is inflammable.

Carbolic Acid is faintly acid to litmus paper.

The aqueous solution of the Acid yields, with bromine water, a white precipitate which at first redissolves, but becomes permanent as more of the reagent is added, and appears crystalline when viewed under the microscope.

On adding to 10 Cc. of a 1-per-cent. aqueous solution of the Acid, 1 drop of ferric chloride T.S., the liquid acquires a violet-blue color which is permanent; and on adding Carbolic Acid either to albumen or to collodion, coagulation takes place (difference from *creosote*).

One volume of cold, liquefied Carbolic Acid (rendered liquid by the addition of 8 per cent. of water) forms, with 1 volume of glycerin, a clear liquid which is not rendered turbid by the addition of 3 volumes of water (absence of *creosote* or of *creosylic acid*).

If 0.039 Gm. of Carbolic Acid be tested by the method immediately following, there should be required for its complete conversion into tribromophenol not less than 24 Cc. of decinormal bromine V.S. (each Cc. of the volumetric solution corresponding to 4 per cent. of absolute Phenol).

Valuation of Carbolic Acid. Dissolve 1.563 Gm. of the Carbolic Acid to be valued in a sufficient quantity of water to make 1000 Cc. Transfer 25 Cc. of this solution (containing 0.039 Gm. of the acid) to a glass-stoppered bottle having a capacity of about 200 Cc., add 30 Cc. of decinormal bromine V.S. (which is 5 Cc. more than would be required if the carbolic acid in the solution were absolute phenol, the excess being added to promote the formation and separation of tribromophenol), then 5 Cc. of hydrochloric acid, and immediately insert the stopper. Shake the bottle repeatedly in the course of half an hour, then remove the stopper just sufficiently to introduce quickly 5 Cc. of a 20-per-cent. aqueous solution of potassium iodide, being careful that no bromine vapor escape, and immediately stopper the bottle. Shake the latter thoroughly, remove the stopper and rinse it and the neck of the bottle with a little water, so that the washings may flow into the bottle, and then add, from a burette, decinormal sodium hyposulphite V.S., until the iodine tint is exactly discharged, using towards the end a few drops of starch T.S. as indicator. Note the number of Cc. of decinormal sodium hyposulphite V.S. consumed. Deduct this from 30 (the number of Cc. of bromine V.S. originally added), and multiply the remainder by 4. The product will, approximately, represent the percentage of absolute Phenol in the Carbolic Acid tested.

Preparation: Glyceritum Acidi Carbolici. Unguentum Acidi Carbolici.

ACIDUM CARBOLICUM CRUDUM.

CRUDE CARBOLIC ACID.

A liquid consisting of various constituents of coal-tar, chiefly cresol and phenol, obtained by fractional distillation.

A nearly colorless, or reddish, or brownish-red liquid, of a strongly empyreumatic and creosote-like odor; having a benumbing, blanching, and caustic effect upon the skin or mucous membrane; and gradually turning darker on exposure to air and light.

The aqueous solution of Crude Carbolic Acid has a slightly acid reaction on litmus paper.

In an aqueous solution of the Acid, bromine water produces a white precipitate.

Crude Carbolic Acid should not be soluble in less than 15 parts of water at 15° C. (59° F.), and the aqueous solution should not have an alkaline reaction (absence of *alkalies*).

If 50 volumes of the Acid be thoroughly agitated with 950 volumes of water, in a capacious vessel, on allowing the mixture to separate, the undissolved portion should not exceed 5 volumes, or 10 per cent. by volume of the acid (limit of other *less soluble constituents of coal-tar*).

ACIDUM CHROMICUM.

CHROMIC ACID.



[CHROMIC TRIOXIDE. CHROMIC ANHYDRIDE.]

Chromic Acid should be kept in glass-stoppered bottles, and great caution should be observed to avoid bringing it in contact with organic substances, such as cork, tannic acid, sugar, alcohol, etc., as dangerous accidents are liable to result.

Small, needle-shaped crystals, or rhombic prisms, of a dark purplish-red color and metallic lustre; odorless; destructive to animal and vegetable tissues; deliquescent in moist air.

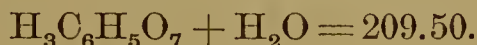
Very soluble in water, forming an orange-red solution. When brought in contact with alcohol, ether, glycerin, and other organic solvents, decomposition takes place, sometimes with dangerous violence.

When Chromic Acid is heated, its color darkens, and finally becomes black, but is restored on cooling. At 192° to 193° C. (377.6° to 379.4° F.) it fuses to a reddish-brown liquid, which, on cooling, forms a dark red, brittle mass (often enclosing cavities filled with crystals), furnishing a scarlet powder. Above 250° C. (482° F.) it begins to decompose into green chromic oxide and free oxygen, and, after protracted heating, leaves a residue of pure chromic oxide, which should yield nothing soluble to water.

A solution of 1 Gm. of Chromic Acid in 100 Cc. of water previously acidulated with a few Cc. of hydrochloric acid, should not be rendered turbid on the addition of 1 Cc. of barium chloride T.S. (absence of *sulphuric acid*).

ACIDUM CITRICUM.

CITRIC ACID.



An organic acid, usually prepared from lemon-juice.

Colorless, translucent, right-rhombic prisms; odorless; having an agreeable, purely acid taste; efflorescent in warm air, and deliquescent when exposed to moist air.

Soluble, at 15° C. (59° F.), in 0.63 part of water, and in 1.61 parts of alcohol; in about 0.4 part of boiling water, and in 1.43 parts of boiling alcohol; also soluble in 18 parts of ether.

When heated to about 75° C. (167° F.), the acid begins to lose its water of crystallization; at about 135° C. (275° F.) it becomes anhydrous, and melts between 135° and 152° C. (275° and 305.6° F.).

When slowly ignited, it is gradually decomposed without emitting the odor of burning sugar (difference from *tartaric acid*), and is finally consumed without leaving more than 0.05 per cent. of residue.

Citric Acid has an acid reaction.

On adding 1 Cc. of an aqueous solution (1 in 10) of the Acid to 50 Cc. of calcium hydrate T.S. (or so much more of the latter that the mixture has an alkaline reaction), the liquid remains clear. Upon boiling this for about one minute, it becomes opaque through the precipitation of calcium citrate, which redissolves on cooling.

If 1 Gm. of the powdered Acid be dissolved in 5 Cc. of a cold solution (1 in 3) of potassium acetate, the liquid should remain clear, even after the addition of an equal volume of alcohol (absence of *tartaric* or *oxalic acid*).

On mixing 10 Cc. of a 10-per-cent. aqueous solution of the Acid with a quantity of ammonia water insufficient to neutralize it completely, and adding to one-half of this liquid 1 Cc. of ammonium oxalate T.S., it should remain clear (absence of *calcium*).

The other half, mixed with a few Cc. of hydrogen sulphide T.S., should not deposit a colored precipitate, nor acquire more than a faintly brownish-yellow tint (limit of *metallic impurities*).

On treating 10 Cc. of a 1-per-cent. aqueous solution of the Acid with 1 Cc. of barium chloride T.S. and a few drops of hydrochloric acid, the liquid should not show any turbidity within five minutes (limit of *sulphuric acid*).

To neutralize 3.5 Gm. of Citric Acid should require 50 Cc. of potassium hydrate V.S. (each Cc. corresponding to 2 per cent. of the pure acid), phenolphthalein being used as indicator.

Preparation: Syrupus Acidi Citrici.

ACIDUM GALLICUM.**GALLIC ACID.**

An organic acid, usually prepared from tannic acid.

White, or pale fawn-colored, silky, interlaced needles, or triclinic prisms; odorless; having an astringent or slightly acidulous taste; permanent in the air.

Soluble, at 15° C. (59° F.), in 100 parts of water, and in 5 parts of alcohol; in 3 parts of boiling water, and in 1 part of boiling alcohol. Also soluble in 40 parts of ether, and in 12 parts of glycerin. Very slightly soluble in chloroform, benzol, or benzin.

When heated at 100° C. (212° F.), the Acid loses its water of crystallization (nearly 9.6 per cent.). At about 222° C. (431.6° F.) it begins to melt, and at a higher temperature it is gradually decomposed. At a low red heat it is consumed without leaving a residue.

Gallic Acid has an acid reaction.

If 5 Cc. of a cold saturated aqueous solution of the Acid be treated, in a watch-glass, with 6 drops of sodium hydrate T.S., the liquid will gradually acquire a deep green color, which is changed to reddish or brownish-red by acids.

Gallic Acid neither colors nor precipitates pure ferrous salts, but forms a bluish-black precipitate with ferric salts.

On adding to a cold, saturated, aqueous solution of Gallic Acid some calcium hydrate T.S., a bluish-white precipitate will form, where the test-solution is temporarily in excess, and will disappear on shaking. When the test-solution has been added in excess, the precipitate no longer dissolves, and the liquid acquires a tint which is blue by reflected and green by transmitted light, and becomes pink on the addition of a large excess of calcium hydrate T.S. (distinction from *tannic acid*).

An aqueous solution of the Acid should not precipitate alkaloids, gelatin, albumen, or starch T.S. (difference from and absence of *tannic acid*).

ACIDUM HYDROBROMICUM DILUTUM.**DILUTED HYDROBROMIC ACID.**

A liquid composed of 10 per cent., by weight, of absolute Hydrobromic Acid [$\text{HBr} = 80.76$], and 90 per cent. of Water.

Diluted Hydrobromic Acid should be kept in glass-stoppered bottles, protected from light.

A clear, colorless liquid, odorless, and having a strongly acid taste.

Specific gravity: about 1.077 at 15° C. (59° F.).

Miscible, in all proportions, with water and alcohol.

By heat it is completely volatilized. On distilling it, water and weak acid first pass over. When the temperature of 126° C. (258.8° F.) is reached, an acid of 47.8 per cent. remains, which may be distilled unchanged.

With litmus paper it shows a strongly acid reaction.

On adding an equal volume of chlorine water to Diluted Hydrobromic Acid, bromine is liberated, and, if a few drops of chloroform are now added and shaken with it, the bromine will dissolve in the chloroform with a yellow color (absence of *iodine*).

Silver nitrate T.S. causes a yellowish-white precipitate, somewhat soluble in hydrobromic acid, insoluble in diluted nitric acid, very slightly soluble in ammonia water, but more soluble in stronger ammonia water.

Copper sulphate T.S. produces a deep-red color upon addition of sulphuric acid.

On being kept for some time, the Acid should not become colored.

Barium chloride T.S. should not produce a turbidity or precipitate (absence of *sulphuric acid*).

If 1 Cc. of the Acid be mixed with 1 Cc. of stannous chloride T.S. (see List of Reagents, Bettendorff's Test for Arsenic), and a small piece of pure tin-foil added, no brown coloration should appear within half an hour (limit of *arsenic*).

To neutralize 8.08 Gm. of Diluted Hydrobromic Acid should require 10 Cc. of normal potassium hydrate V.S. (each Cc. corresponding to 1 per cent. of the absolute acid), phenolphthalein being used as indicator.

ACIDUM HYDROCHLORICUM.

HYDROCHLORIC ACID.

[MURIATIC ACID.]

A liquid composed of 31.9 per cent., by weight, of absolute Hydrochloric Acid [$\text{HCl} = 36.37$], and 68.1 per cent. of water.

Hydrochloric Acid should be kept in dark amber-colored, glass-stoppered bottles.

A colorless, fuming liquid, of a pungent odor, and an intensely acid taste. Fumes and odor disappear on diluting the Acid with 2 volumes of water.

Specific gravity : about 1.163 at 15° C. (59° F.).

Miscible, in all proportions, with water and alcohol.

On heating it, at first a stronger acid passes off, until, at 110° C. (230° F.), a liquid containing 20.18 per cent. of the absolute acid remains (specific gravity about 1.102 at 15° C.), which distils unchanged, leaving no residue, if the Acid was perfectly pure.

With litmus paper it shows an intensely acid reaction, even after great dilution.

Heated with manganese dioxide, it gives off chlorine.

With silver nitrate T.S. it yields a white, curdy precipitate, insoluble in nitric acid, but readily soluble in ammonia water, forming a colorless liquid (absence of *copper*).

If 10 Cc. of the Acid be evaporated from a platinum or porcelain capsule, not more than a bare trace of residue should be left (limit of *non-volatile impurities*).

A few drops of chloroform, added to 1 Cc. of Hydrochloric Acid diluted with 2 Cc. of water, should not become colored, either at once, or after the addition of a few drops of freshly prepared chlorine water, or of a granule of potassium chlorate (absence of *iodine* or *bromine*).

If 1 Cc. of the acid be diluted with 5 Cc. of water and 0.5 Cc. of zinc-iodide-starch T.S. added, no blue color should appear (absence of *chlorine* or *bromine*).

On adding 1 Cc. of stannous chloride T.S. (see List of Reagents, Bettendorff's Test for Arsenic), together with a small piece of pure tin-foil, to 1 Cc. of the Acid, no coloration should occur within one hour (limit of *arsenic*).

If 1 Cc. of the Acid be diluted with 5 Cc. of water, and a few drops of barium chloride T.S. added, no precipitate or turbidity should appear within one hour (absence of *sulphuric acid*), nor should the addition to this mixture of a few drops of decinormal iodine V.S. produce any turbidity (absence of *sulphurous acid*).

When a few Cc. of freshly saturated hydrogen sulphide T.S. are poured carefully on top of an equal volume of Hydrochloric Acid, no color should develop at the zone of contact (absence of *thallium*, *arsenic*, *lead*, etc.).

If 1 Cc. of Hydrochloric Acid be slightly supersaturated with ammonia

water, and 1 Cc. of ammonium sulphide T.S. added, neither a color nor a turbidity should appear (absence of *iron, aluminum, etc.*).

To neutralize 3.64 Gm. of Hydrochloric Acid, diluted with 10 Cc. of water, should require 31.9 Cc. of normal potassium hydrate V.S. (each Cc. corresponding to 1 per cent. of the absolute acid), phenolphthalein being used as indicator.

Preparations: Acidum Hydrochloricum Dilutum. Acidum Nitrohydrochloricum. Acidum Nitrohydrochloricum Dilutum.

ACIDUM HYDROCHLORICUM DILUTUM.

DILUTED HYDROCHLORIC ACID.

[DILUTED MURIATIC ACID.]

Hydrochloric Acid, <i>one hundred grammes</i>	100 Gm.
Distilled Water, <i>two hundred and nineteen grammes</i>	219 Gm.

To make *three hundred and nineteen grammes*.... 319 Gm.

Mix them. Keep the product in glass-stoppered bottles.

Diluted Hydrochloric Acid contains 10 per cent. of absolute Hydrochloric Acid.

Specific gravity : about 1.050 at 15° C. (59° F.).

It does not fume in the air, and is without odor, but otherwise it corresponds in properties to Hydrochloric Acid (see *Acidum Hydrochloricum*), and should conform to the same reactions and tests.

To neutralize 3.64 Gm. of Diluted Hydrochloric Acid should require 10 Cc. of normal potassium hydrate V.S. (each Cc. corresponding to 1 per cent. of the absolute acid), phenolphthalein being used as indicator.

ACIDUM HYDROCYANICUM DILUTUM.

DILUTED HYDROCYANIC ACID.

[PRUSSIC ACID.]

A liquid composed of 2 per cent., by weight, of absolute Hydrocyanic Acid [$\text{HCN} = 26.98$], and 98 per cent. of water.

Potassium Ferrocyanide, in coarse powder, <i>twenty grammes</i>	20 Gm.
Sulphuric Acid, <i>eight cubic centimeters</i>	8 Cc.
Water	65 Cc.
Distilled Water, <i>a sufficient quantity</i> .	

Place the Potassium Ferrocyanide in a tubulated retort, and add to it *forty* (40) *cubic centimeters* of Water. Connect the neck of the retort (which is to be directed upward), by means of a bent tube, with a well-cooled condenser, the delivery tube of which terminates in a receiver surrounded with ice-cold water, and containing *sixty-five* (65) *cubic centimeters* of Distilled Water. All the joints of the apparatus, except the neck of the receiver, having been made air-tight by means of well-fitting corks, pour into the retort, through the tubulure, the Sulphuric Acid, previously diluted with *twenty-five* (25) *cubic centimeters* of Water.

Gently mix the contents of the retort, and then heat it, in a sand-bath, so as to keep the liquid in brisk ebullition, until about one-half of its volume has passed over into the receiver. Detach the receiver, and assay a small portion of the contents by the method given below. Then add to the remainder so much Distilled Water as may be required to bring the product to the strength of *two (2) per cent.*, by weight, of absolute Hydrocyanic Acid.

Diluted Hydrocyanic Acid may also be prepared, extemporaneously, in the following manner :

Silver Cyanide, <i>six grammes</i>	6 Gm.
Hydrochloric Acid, <i>five cubic centimeters</i>	5 Cc.
Distilled Water, <i>fifty-five cubic centimeters</i>	55 Cc.

Mix the Hydrochloric Acid with the Distilled Water, add the Silver Cyanide, and shake the whole together in a glass-stoppered bottle. When the precipitate has subsided, pour off the clear liquid.

Diluted Hydrocyanic Acid should be kept in small, dark amber-colored, cork-stoppered vials, in a cool place.

A colorless liquid, of a characteristic odor and taste, resembling those of bitter almonds. As it is very poisonous, great care should be taken in tasting it.

It is completely volatilized by heat.

With litmus paper it shows an acid reaction.

If to 1 Cc. of the Acid, rendered alkaline by potassium hydrate T.S., a few drops, each, of ferrous sulphate T.S. and ferric chloride T.S. be added, and the mixture then acidulated with hydrochloric acid, a blue precipitate will be formed.

To ascertain the percentage strength, mix in a flask (of the capacity of about 100 Cc.) 0.27 Gm. of Hydrocyanic Acid (obtained by distillation as above directed) with sufficient water and magnesia to make an opaque mixture of about 10 Cc. Add to this 2 or 3 drops of potassium chromate T.S., and then, from a burette, decinormal silver nitrate V.S., until a red tint is produced which does not again disappear by shaking. Each Cc. of silver nitrate V.S. used indicates 1 per cent. of absolute Hydrocyanic Acid.

After ascertaining the strength of the distillate, dilute it with Distilled Water so as to bring it to the strength of 2 per cent. of absolute acid. Lastly, test the finished product again, when 1.35 Gm. of it should require, for complete precipitation, 10 Cc. of decinormal silver nitrate V.S.

ACIDUM HYPOPHOSPHOROSUM DILUTUM.

DILUTED HYPOPHOSPHOROUS ACID.

A liquid composed of about 10 per cent., by weight, of absolute Hypophosphorous Acid [$\text{HPH}_2\text{O}_2 = 65.88$], and about 90 per cent. of water.

A colorless liquid, without odor, and having an acid taste.

Specific gravity : about 1.046 at 15° C. (59° F.).

Miscible, in all proportions, with water.

When heated in a porcelain capsule, it evaporates, losing at first principally water and becoming more concentrated. On further heating it decomposes,

forming hydrogen phosphide which ignites, and phosphoric acid. The pasty residue finally reddens, ignites, and the last portions of phosphorus burn out at higher heat.

From silver nitrate T.S. it reduces black metallic silver.

When the Acid is gently heated with copper sulphate T.S., a yellow precipitate of copper hydride falls, which rapidly assumes a reddish-brown color.

The addition of hydrogen sulphide T.S. to the Acid should produce neither a precipitate, nor a coloration (absence of *lead*, etc.).

If some of the Acid be neutralized with ammonia water, separate portions of the liquid should not yield a precipitate with ammonium sulphide T.S. (absence of *iron*, etc.), nor with ammonium oxalate T.S. (absence of *calcium*); nor should more than a slight turbidity be produced by barium chloride T.S. (limit of *phosphoric*, *sulphuric*, *oxalic*, and *tartaric acids*).

Neither platinic chloride T.S. nor sodium cobaltic nitrite T.S. should produce more than a slight yellow turbidity in the diluted acid (limit of *potassium*).

If 0.5 Gm. of Diluted Hypophosphorous Acid be mixed with 7 Cc. of sulphuric acid and 35 Cc. of decinormal potassium permanganate V.S., and the mixture boiled for fifteen minutes, it should require about 4.7 Cc. of decinormal oxalic acid V.S. to discharge the red color, corresponding to about 10 per cent. of absolute Hypophosphorous Acid.

To neutralize 6.6 Gm. of Diluted Hypophosphorous Acid should require about 10 Cc. of normal potassium hydrate V.S. (each Cc. corresponding to 1 per cent. of the absolute acid), phenolphthalein being used as indicator.

ACIDUM LACTICUM.

LACTIC ACID.

An organic acid, usually obtained by subjecting milk-sugar or grape-sugar to lactic fermentation; composed of 75 per cent., by weight, of absolute Lactic Acid [$\text{HC}_3\text{H}_5\text{O}_3 = 89.79$], and 25 per cent. of water.

A colorless, syrupy liquid, odorless, of a purely acid taste, and absorbing moisture on exposure to damp air.

Specific gravity: about 1.213 at 15° C. (59° F.).

Freely miscible with water, alcohol, or ether; insoluble in chloroform, benzin, or carbon disulphide.

Lactic Acid is not vaporized by a heat below 160° C. (320° F.); at a higher temperature it emits inflammable vapors, and is finally dissipated. 5 Gm., after combustion, should not leave more than 0.05 Gm. of fixed residue.

Lactic Acid has a strongly acid reaction.

On adding some potassium permanganate to a mixture of equal volumes of Lactic and sulphuric acids, and gently heating, the odor of aldehyde will become perceptible.

10 Cc. of a 1-per-cent. aqueous solution of the Acid should not be rendered opalescent by the addition of 1 Cc. of silver nitrate T.S. (limit of *chloride*).

10 Cc. of a 10-per-cent. aqueous solution should remain unaffected by the addition of 1 Cc. of barium chloride T.S. (absence of *sulphate*), or by 1 Cc. of copper sulphate T.S. (absence of *sarcocollactic acid*), or, after supersaturation with ammonia, by 1 Cc. of ammonium sulphide T.S. (absence of *iron*, *lead*, etc.).

On adding a few drops of Lactic Acid to 10 Cc. of hot alkaline cupric tartrate V.S., no red cuprous oxide should be separated (absence of *sugars*).

If a small portion of the Acid be heated with an excess of zinc carbonate, the mixture dried at 100° C. (212° F.), and then extracted with absolute alcohol, upon evaporation of the latter no sweet residue should remain (absence of *glycerin*).

On mixing equal volumes of Lactic and colorless, concentrated sulphuric acids in a small, clean, glass-stoppered vial, the mixture should not acquire a

tint deeper than a pale straw color (absence of more than traces of *organic impurities*).

To neutralize 4.5 Gm. of Lactic Acid should require 37.5 Cc. of potassium hydrate V.S. (each Cc. corresponding to 2 per cent. of absolute acid), phenolphthalein being used as indicator.

Preparation: Syrupus Calcii Lactophosphatis.

ACIDUM NITRICUM.

NITRIC ACID.

A liquid composed of 68 per cent., by weight, of absolute Nitric Acid [$\text{HNO}_3 = 62.89$], and 32 per cent. of water.

Nitric Acid should be kept in dark amber-colored, glass-stoppered bottles.

A colorless, fuming liquid, very caustic and corrosive, and having a peculiar, somewhat suffocating odor.

Specific gravity: about 1.414 at 15°C. (59°F.).

It boils at 120.5°C. (248.9°F.), and is completely volatilized.

It dissolves copper, mercury, silver, and other metals with evolution of red vapors, and stains woollen fabrics and animal tissues a bright yellow.

Heated with indigo T.S., it discharges the blue color of the latter.

Even when highly diluted, it shows an intensely acid reaction with litmus paper.

If 1 Cc. of Nitric Acid be slightly supersaturated with ammonia water, no precipitate should be formed (absence of *iron*, or *much lead*); nor should the liquid assume a blue tint (*copper*); nor should the further addition of a few drops of colorless ammonium sulphide T.S. produce any coloration or precipitate (*lead*, *iron*, *copper*, etc.).

On diluting some of the Acid with 5 times its volume of water, a portion of this liquid, when gently heated and treated with freshly prepared hydrogen sulphide T.S., should not show a colored precipitate (absence of *lead*, *arsenic*, *copper*); nor should any precipitate be produced in other portions of the diluted Acid by barium chloride T.S. (absence of *sulphuric acid*), or by silver nitrate T.S. (absence of *hydrochloric acid*).

If the diluted Acid be shaken with a few drops of chloroform, the latter should remain colorless (absence of *iodine* or *bromine*), even after introduction of a small piece of metallic zinc (absence of *iodic* or *bromic acid*).

To neutralize 3.145 Gm. of Nitric Acid should require 34 Cc. of normal potassium hydrate V.S. (each Cc. corresponding to 2 per cent. of absolute acid), phenolphthalein being used as indicator.

Preparations: Acidum Nitricum Dilutum. Acidum Nitrohydrochloricum. Acidum Nitrohydrochloricum Dilutum.

ACIDUM NITRICUM DILUTUM.

DILUTED NITRIC ACID.

Nitric Acid, *one hundred grammes* 100 Gm.

Distilled Water, *five hundred and eighty grammes* 580 Gm.

To make *six hundred and eighty grammes* . . . 680 Gm.

Mix them. Keep the product in dark amber-colored, glass-stoppered bottles.

Diluted Nitric Acid contains 10 per cent., by weight, of absolute Nitric Acid. Specific gravity : about 1.057 at 15° C. (59° F.).

It corresponds in properties to Nitric Acid (see *Acidum Nitricum*), and should conform to the same reactions and tests.

To neutralize 6.29 Gm. of Diluted Nitric Acid should require 10 Cc. of normal potassium hydrate V.S. (each Cc. corresponding to 1 per cent. of absolute acid), phenolphthalein being used as indicator.

ACIDUM NITROHYDROCHLORICUM.

NITROHYDROCHLORIC ACID.

[NITROMURIATIC ACID.]

Nitric Acid, *one hundred and eighty cubic centimeters*. 180 Cc.

Hydrochloric Acid, *eight hundred and twenty cubic centimeters* 820 Cc.

Mix the Acids in a capacious glass vessel, and, when effervescence has ceased, pour the product into dark amber-colored, glass-stoppered bottles, which should not be more than half filled, and keep them in a cool place.

A golden yellow, fuming, and very corrosive liquid, having a strong odor of chlorine. Completely volatilized by heat. It readily dissolves gold leaf, and a drop of it, added to potassium iodide T.S., liberates iodine.

ACIDUM NITROHYDROCHLORICUM DILUTUM.

DILUTED NITROHYDROCHLORIC ACID.

[DILUTED NITROMURIATIC ACID.]

Nitric Acid, *forty cubic centimeters* 40 Cc.

Hydrochloric Acid, *one hundred and eighty cubic centimeters* 180 Cc.

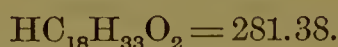
Distilled Water, *seven hundred and eighty cubic centimeters*. 780 Cc.

Mix the Acids in a capacious glass vessel, and, when effervescence has ceased, add the Distilled Water. Keep the product in dark amber-colored, glass-stoppered bottles, in a cool place.

A colorless or pale yellowish liquid, having a faint odor of chlorine, and a very acid taste. Completely volatilized by heat. From potassium iodide T.S. it liberates iodine.

ACIDUM OLEICUM.

OLEIC ACID.



An organic acid, prepared in a sufficiently pure condition by cooling commercial Oleic Acid to about 5° C. (41° F.), then separating and preserving the liquid portion.

A yellowish or brownish-yellow, oily liquid, having a peculiar, lard-like odor and taste ; becoming darker and absorbing oxygen on exposure to air.

Specific gravity : about 0.900 at 15° C. (59° F.).

Insoluble in water ; soluble in alcohol, chloroform, benzol, benzin, oil of turpentine, and fixed and volatile oils.

When cooled to about 4° C. (39.2° F.), Oleic Acid becomes semi-solid, and, on further cooling, congeals to a whitish, solid mass.

When heated to a temperature of about 95° C. (203° F.), the Acid begins to be decomposed, giving off acrid vapors. At a higher temperature it is completely dissipated.

An alcoholic solution of Oleic Acid has a feebly acid reaction upon litmus paper.

Equal volumes of Oleic Acid and of alcohol, mixed at the ordinary temperature, should give a clear solution without separating any oily drops upon the surface (absence of *fixed oils*).

If 1 Gm. of Oleic Acid be heated with 20 Cc. of alcohol, 2 drops of phenolphthalein T.S. added, and then a strong solution (1 in 4) of sodium hydrate, drop by drop, until the liquid has acquired a permanent red tint and the Acid is saponified ; next acetic acid added until the red color of the liquid is just discharged, and the liquid filtered,—10 Cc. of the filtrate mixed with 10 Cc. of ether should not be rendered more than slightly turbid by the addition of 1 Cc. of lead acetate T.S. (absence of notable quantities of *palmitic* and *stearic acids*).

ACIDUM PHOSPHORICUM.

PHOSPHORIC ACID.

A liquid composed of not less than 85 per cent., by weight, of absolute Orthophosphoric Acid [$\text{H}_3\text{PO}_4 = 97.8$], and not more than 15 per cent. of water.

The above-mentioned percentage (85) is that assumed for Phosphoric Acid in the formulas of pharmacopœial preparations.

Phosphoric Acid should be kept in glass-stoppered bottles.

A colorless liquid, without odor, but having a strongly acid taste.

Specific gravity : not below 1.710 at 15° C. (59° F.).

Miscible, in all proportions, with water or alcohol.

When heated, the liquid loses water ; at 200° C. (392° F.) it gradually begins to change to pyrophosphoric acid. At a still higher temperature it is converted into metaphosphoric acid, which volatilizes in dense fumes, or forms, on cooling, a transparent mass of glacial Phosphoric Acid.

The Acid, even when largely diluted, has an intensely acid reaction upon litmus paper.

If a small portion of Phosphoric Acid be supersaturated with ammonia water, the addition of magnesium sulphate T.S. (or of magnesia mixture) produces a white, crystalline precipitate. If this precipitate be dissolved in diluted acetic acid, the solution yields a yellow precipitate with silver nitrate T.S.

If a crystal of ferrons sulphate be dropped into a cooled mixture of 1 Cc., each, of Phosphoric and sulphuric acids, no brown or brownish-black color should appear around the crystal (absence of *nitric acid*).

If 1 Cc. of Phosphoric Acid be diluted with 5 Cc. of water, and the liquid gently warmed, it should not be blackened upon the addition of a small amount of silver nitrate T.S., or rendered turbid by mercuric chloride T.S. (absence of *phosphorous acid*).

If 1 Cc. of Phosphoric Acid (in which nitric and phosphorous acids have previously been shown to be absent) be mixed with 1 Cc. of stannous chloride

T.S. (see List of Reagents, Bettendorff's Test for Arsenic), and a small piece of pure tin-foil added, no coloration should appear within one hour (limit of arsenic).

Upon adding to 1 Cc. of Phosphoric Acid a mixture of 3 Cc. of alcohol and 1 Cc. of ether, no turbidity should appear (absence of *phosphate*).

After neutralizing a portion of the Acid with ammonia water, the addition of ammonium sulphide T.S. should produce neither a color nor a precipitate (absence of *iron*, etc.).

After diluting a portion of the Acid with 5 volumes of water, no precipitate should be produced, in separate portions of the liquid, by barium chloride T.S. (absence of *sulphuric acid*), or by silver nitrate T.S. (absence of *hydrochloric acid*); nor should any precipitate be formed, even after several hours, by the addition of an equal volume of tincture of ferric chloride (absence of *pyrophosphoric* and *metaphosphoric acids*).

0.978 Gm. of Phosphoric Acid, diluted with water, should require, for neutralization, not less than 17 Cc. of normal potassium hydrate V.S. (each Cc. corresponding to 5 per cent. of the absolute acid), phenolphthalein being used as indicator.

Preparation: Acidum Phosphoricum Dilutum.

ACIDUM PHOSPHORICUM DILUTUM.

DILUTED PHOSPHORIC ACID.

Phosphoric Acid, *one hundred grammes* 100 Gm.

Distilled Water, *seven hundred and fifty grammes* 750 Gm.

To make *eight hundred and fifty grammes* 850 Gm.

Mix them. Keep the product in well-stoppered bottles.

Diluted Phosphoric Acid contains 10 per cent., by weight, of absolute Orthophosphoric Acid.

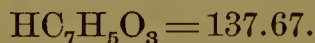
Specific gravity: about 1.057 at 15° C. (59° F.).

It corresponds in properties to Phosphoric Acid (see *Acidum Phosphoricum*), and should conform to the same reactions and tests.

4.89 Gm. of Diluted Phosphoric Acid should require for neutralization 10 Cc. of normal potassium hydrate V.S. (each Cc. corresponding to 1 per cent. of the absolute acid), phenolphthalein being used as indicator.

ACIDUM SALICYLICUM.

SALICYLIC ACID.



An organic acid, existing naturally, in combination, in various plants, but most largely prepared synthetically from carbolic acid.

Light, fine, white, prismatic needles, or a light, white, crystalline powder; odorless, having a sweetish, afterwards acid taste, and permanent in the air.

Soluble, at 15° C. (59° F.), in about 450 parts of water, and in 2.4 parts of alcohol; in 14 parts of boiling water, and very soluble in boiling alcohol. Also soluble in 2 parts of ether, 2 parts of absolute alcohol, and 80 parts of chloroform.

When heated to 156° C. (312.8° F.), the Acid begins to melt, and is completely melted at 157° C. (314.6° F.); at a higher temperature it is gradually dissipated without leaving more than 0.6 per cent. of fixed residue.

The saturated, aqueous solution has an acid reaction, and is colored intensely bluish-violet (in high dilution violet-red) by ferric chloride T.S.

On adding to a small portion of Salicylic Acid, in a test-tube, about 1 Cc. of concentrated sulphuric acid, then, cautiously, about 1 Cc. of methylic alcohol, in drops, and heating the mixture to boiling, the odor of methyl salicylate will be evolved.

On allowing a saturated, alcoholic solution of the Acid to evaporate spontaneously in a glass or porcelain capsule, in a place protected from dust, a perfectly white, crystalline residue should remain (absence of *iron*, *carbolic acid*, or *coloring matter*).

If 1 Gm. of the Acid be dissolved in an excess of cold sodium carbonate T.S., the liquid agitated with an equal volume of ether, and the ethereal solution allowed to evaporate spontaneously, the residue, if any, should be free from the odor of *carbolic acid*.

On treating about 0.5 Gm. of the Acid, in a clean test-tube, with 10 Cc. of concentrated sulphuric acid, no color should be imparted to the latter within fifteen minutes (absence of *readily carbonizable*, *organic impurities*).

A solution of 0.5 Gm. of the Acid in 10 Cc. of alcohol, mixed with a few drops of nitric acid, should remain unaffected upon the addition of a few drops of silver nitrate T.S. (absence of *hydrochloric acid*).

ACIDUM STEARICUM.

STEARIC ACID.



An organic acid, in its commercial, more or less impure form, usually obtained from the more solid fats, chiefly tallow.

A hard, white, somewhat glossy solid, odorless and tasteless, and permanent in the air.

Insoluble in water; soluble in about 45 parts of alcohol at 15° C. (59° F.); readily soluble in boiling alcohol, and in ether.

Stearic Acid, when pure, melts at 69.2° C. (156.6° F.). The commercial acid should have a melting point not lower than 56° C. (132.8° F.), and the melted acid should not become opaque and begin to congeal at a temperature lower than 54° C. (129.2° F.).

If 1 Gm. of Stearic Acid and 1 Gm. of sodium carbonate be boiled with 30 Cc. of water, in a capacious flask, the resulting solution, while hot, should not be more than opalescent (limit of *undecomposed fat*).

ACIDUM SULPHURICUM.

SULPHURIC ACID.

A liquid composed of not less than 92.5 per cent., by weight, of absolute Sulphuric Acid [$\text{H}_2\text{SO}_4 = 97.82$], and not more than 7.5 per cent. of water.

The above-named percentage (92.5) is that assumed for Sulphuric Acid in the formulas of pharmacopœial preparations.

Sulphuric Acid should be kept in glass-stoppered bottles.

A colorless liquid, of oily consistence, inodorous, and very caustic and corrosive.

Specific gravity: not below 1.835 at 15° C. (59° F.).

Miscible, in all proportions, with water and alcohol, with evolution of so much heat, that the mixing requires great caution.

It boils at 338° C. (640.4° F.). When heated on platinum-foil, it is vaporized without leaving a residue.

Even after dilution with much water, it shows an intensely acid reaction with litmus paper.

If Sulphuric Acid be dropped upon sugar or wood, it blackens them.

Diluted with 5 volumes of water, it yields, with barium chloride T.S., a white precipitate, insoluble in hydrochloric acid.

On mixing the Acid carefully with 4 or 5 volumes of alcohol, no precipitate should be formed within one hour (absence of *lead*).

If there be carefully poured upon it, in a test-tube, a layer of ferrous sulphate T.S., the zone of contact should not assume a brown or reddish color (limit of *nitric* or *nitrous acid*).

In Sulphuric Acid, diluted with 20 volumes of water, no precipitate should be formed by the addition of silver nitrate T.S. (absence of *hydrochloric acid*), or of hydrogen sulphide T.S. (absence of *lead*, *arsenic*, *copper*) ; nor by supersaturation with ammonia water (*iron*) ; nor should the acid thus supersaturated leave any fixed residue on evaporation and ignition (absence of *non-volatile impurities*), nor yield any precipitate on addition of ammonium sulphide T.S. (*iron*, *thallium*, etc.).

1 Cc. of Sulphuric Acid, diluted with 5 Cc. of water, and cooled, should not at once discharge the color of 0.1 Cc. of decinormal potassium permanganate V.S. (limit of *sulphurous* or *nitrous acid*).

If 1 Cc. of a mixture of 1 volume of Sulphuric Acid with 2 volumes of water be mixed with 1 Cc. of stannous chloride T.S. (see List of Reagents, Bettendorff's Test for Arsenic), and a small piece of pure tin-foil added, no coloration should appear within one hour (limit of *arsenic*).

To neutralize 0.489 Gm. of Sulphuric Acid, diluted with about 10 Cc. of water, should require not less than 9.25 Cc. of normal potassium hydrate V.S. (each 0.1 Cc. corresponding to 1 per cent. of the absolute acid), phenolphthalein being used as indicator.

Preparations: Acidum Sulphuricum Aromaticum. Acidum Sulphuricum Dilutum.

ACIDUM SULPHURICUM AROMATICUM.

AROMATIC SULPHURIC ACID.

Sulphuric Acid, <i>one hundred cubic centimeters</i>	100 Cc.
Tincture of Ginger, <i>fifty cubic centimeters</i>	50 Cc.
Oil of Cinnamon, <i>one cubic centimeter</i>	1 Cc.
Alcohol, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

Add the Sulphuric Acid gradually, and with great caution, to *seven hundred* (700) *cubic centimeters* of Alcohol, and allow the mixture to cool. Then add to it the Tincture of Ginger and the Oil of Cinnamon, and afterwards enough Alcohol to make the whole measure *one thousand* (1000) *cubic centimeters*. Keep the product in glass-stoppered bottles.

Aromatic Sulphuric Acid contains about 20 per cent., by weight, of official Sulphuric Acid, partly in form of ethyl-sulphuric acid.

Specific gravity: about 0.939 at 15° C. (59° F.).

If 4.89 Gm. of Aromatic Sulphuric Acid be mixed, in a small flask, with 15 Cc. of water and boiled for several minutes (so as to decompose the ethyl-sulphuric acid), and the liquid be then allowed to cool, it should require, for complete neutralization, about 18.5 Cc. of normal potassium hydrate V.S. (each Cc. corresponding to 1 per cent. of absolute or about 1.08 per cent. of official Sulphuric Acid), phenolphthalein being used as indicator.

ACIDUM SULPHURICUM DILUTUM.**DILUTED SULPHURIC ACID.**

Sulphuric Acid, <i>one hundred grammes</i>	100 Gm.
Distilled Water, <i>eight hundred and twenty-five grammes</i> . . .	825 Gm.

To make *nine hundred and twenty-five grammes* . . . 925 Gm.

Pour the Acid gradually, under constant stirring, into the Distilled Water. Keep the product in glass-stoppered bottles.

Diluted Sulphuric Acid contains 10 per cent., by weight, of absolute Sulphuric Acid.

Specific gravity : about 1.070 at 15° C. (59° F.).

It should respond to the reactions and tests given under Sulphuric Acid (see *Acidum Sulphuricum*).

To neutralize 4.89 Gm. of Diluted Sulphuric Acid should require 10 Cc. of normal potassium hydrate V.S. (each Cc. corresponding to 1 per cent. of the absolute acid), phenolphthalein being used as indicator.

ACIDUM SULPHUROSUM.**SULPHUROUS ACID.**

A liquid composed of not less than 6.4 per cent., by weight, of Sulphurous Acid Gas [Sulphur Dioxide, $\text{SO}_2 = 63.9$], and not more than 93.6 per cent. of water.

Sulphuric Acid, <i>eighty cubic centimeters</i>	80 Cc.
Charcoal, in coarse powder, <i>twenty grammes</i>	20 Gm.
Distilled Water, <i>one thousand cubic centimeters</i>	1000 Cc.

Introduce the Charcoal into a glass flask having a capacity of about *five hundred* (500) *cubic centimeters*, add the Acid, and mix them well. Connect the flask, by means of suitable glass tubing, with a wash-bottle having a capacity of about *two hundred* (200) *cubic centimeters*, which is filled to about one-third of its height with water. Through the stopper of the wash-bottle pass a safety-tube, which should reach nearly to the bottom of the bottle, and connect the latter, by means of glass tubing, with a bottle having a capacity of about *fifteen hundred* (1500) *cubic centimeters* and containing *one thousand* (1000) *cubic centimeters* of Distilled Water deprived of air by being boiled shortly before use. The tube should dip about twenty-five millimeters below the surface of the Distilled Water. By means of a second tube connect this bottle with another containing a dilute solution of sodium carbonate, to absorb any gas which may not be retained by the Distilled Water. Having ascertained that all the connections are air-tight, apply a moderate heat to the flask con-

taining the Sulphuric Acid and Charcoal, until the evolution of gas has nearly ceased, and, during the passage of the gas, keep the bottle containing the Distilled Water at or below 10° C. (50° F.), by surrounding it with cold water or ice. Finally pour the Sulphurous Acid into dark amber-colored, glass-stoppered bottles, and keep them in a cool place, protected from light.

A colorless liquid, of the characteristic odor of burning sulphur, and of a very acid, sulphurous taste.

Specific gravity: not less than 1.035 at 15° C. (59° F.).

By heat it is completely volatilized.

Litmus paper moistened with the Acid is first reddened and afterwards bleached.

On gently heating a few Cc. of the Acid in a test-tube, the gas evolved will blacken a strip of paper moistened with mercurous nitrate T.S., but will not affect one moistened with lead acetate T.S.

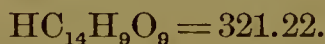
On mixing, in a test-tube, 1 Cc. of Sulphurous Acid with 5 Cc. of diluted hydrochloric acid, and adding a small piece of pure zinc, hydrogen sulphide gas will be evolved, which will blacken a strip of paper moistened with lead acetate T.S.

If to 10 Cc. of Sulphurous Acid there be added 1 Cc. of diluted hydrochloric acid, and afterwards 1 Cc. of barium chloride T.S., not more than a very slight turbidity should be produced (limit of *sulphuric acid*).

If 2 Gm. of Sulphurous Acid be diluted with 25 Cc. of distilled water and a little starch T.S. be added, at least 40 Cc. of decinormal iodine V.S. should be required, before a permanent blue tint is developed (each Cc. corresponding to 0.16 per cent. of Sulphur Dioxide).

ACIDUM TANNICUM.

TANNIC ACID.



[GALLOTANNIC ACID. DIGALLIC ACID.]

An organic acid obtained from nutgall.

A light yellowish, amorphous powder, usually cohering in form of glistening scales or spongy masses, odorless, or having a faint, characteristic odor, and a strongly astringent taste; gradually turning darker when exposed to air and light.

Soluble, at 15° C. (59° F.), in about 1 part of water, and in 0.6 part of alcohol; very soluble in boiling water, and in boiling alcohol; also in about 1 part of glycerin, with the intervention of a moderate heat; freely soluble in diluted alcohol, sparingly in absolute alcohol; almost insoluble in absolute ether, chloroform, benzol, or benzin.

When heated on platinum foil, the Acid is gradually consumed without leaving more than 0.2 per cent. of ash.

Tannic Acid has an acid reaction upon litmus paper.

The addition of a small quantity of ferric chloride T.S. to an aqueous solution of the Acid produces a bluish-black color or precipitate.

On adding to an aqueous solution (1 in 100) of Tannic Acid a small quantity of calcium hydrate T.S., a pale bluish-white, flocculent precipitate is produced which is not dissolved on shaking (difference from *gallic acid*), and which becomes more copious and of a deeper blue by the addition of a moderate excess of calcium hydrate T.S., while a large excess of the latter imparts a pale pinkish tint to the solution.

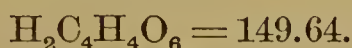
The aqueous solution of the Acid produces precipitates with most alkaloids and bitter principles, and with test-solutions of gelatin, albumen, and starch (distinction from *gallic acid*).

On dissolving 2 Gm. of Tannic Acid in 10 Cc. of boiling water, and allowing the liquid to cool, no turbidity should be produced on diluting 5 Cc. of the solution with 10 Cc. of alcohol (absence of *gum* or *dextrin*), or with 10 Cc. of water (absence of *resin*).

Preparations: Collodium Stypticum. Glyceritum Acidi Tannici. Trochisci Acidi Tannici. Unguentum Acidi Tannici.

ACIDUM TARTARICUM.

TARTARIC ACID.



An organic acid usually prepared from argols.

Colorless, translucent, monoclinic prisms, or crystalline crusts, or a white powder, odorless, having a purely acid taste, and permanent in the air.

Soluble, at 15° C. (59° F.), in about 0.8 part of water, and in 2.5 parts of alcohol; in about 0.5 part of boiling water, and in about 0.2 part of boiling alcohol; also in 250 parts of ether; nearly insoluble in chloroform, benzol, or benzin.

When heated for some time at 100° C. (212° F.), the powdered crystals do not suffer a sensible loss of weight. At 135° C. (275° F.) the Acid melts. At higher temperatures it is gradually decomposed, emitting the odor of burning sugar, and is finally consumed without leaving more than 0.05 per cent. of ash.

Tartaric Acid has an acid reaction upon litmus paper.

An aqueous solution (1 in 2) of the Acid mixed with a strong solution (1 in 3) of potassium acetate yields a white, crystalline precipitate which is soluble in solutions of alkalies and in mineral acids, but insoluble in acetic acid.

The aqueous solution (1 in 10) of the Acid, acidulated with a few drops of hydrochloric acid, should remain unaffected by barium chloride T.S. (absence of *sulphuric acid*).

Another portion of the aqueous solution (1 in 10) in which the free acid has been nearly, but not entirely, neutralized by ammonia, should not be affected by calcium sulphate T.S. (absence of, and difference from, *oxalic* and *uric acids*).

On supersaturating 10 Cc. of the aqueous solution (1 in 10) with ammonia water, no turbidity should be produced in the liquid by ammonium oxalate T.S. (absence of *calcium*), nor should the further addition of 1 drop of ammonium sulphide T.S. produce any dark coloration or precipitate (absence of *iron*, *lead*, *copper*, etc.).

To neutralize 3.75 Gm. of Tartaric Acid should require 50 Cc. of potassium hydrate V.S. (each Cc. corresponding to 2 per cent. of the pure acid), phenolphthalein being used as indicator.

ACONITUM.

ACONITE.

The tuber of *Aconitum Napellus* Linné (nat. ord. *Ranunculaceæ*).

From 10 to 20 Mm. thick at the crown; conically contracted below; from 50 to 75 Mm. long, with scars or fragments of radicles; dark brown externally; whitish internally; with a rather thick bark, the central axis about seven-rayed; without odor; taste at first sweetish, soon becoming acrid, and producing a sensation of tingling and numbness, which lasts for some time.

Preparations: Extractum Aconiti. Extractum Aconiti Fluidum. Tinctura Aconiti.

ADEPS.

LARD.

The prepared internal fat of the abdomen of *Sus Scrofa* Linné (class *Mammalia*; order *Pachydermata*), purified by washing with water, melting, and straining.

Lard should be kept in well-closed vessels impervious to fat, and in a cool place.

A soft, white, unctuous solid, having a faint odor free from rancidity, and a bland taste.

Insoluble in water; very slightly soluble in alcohol; readily soluble in ether, chloroform, carbon disulphide, or benzin.

Specific gravity: about 0.932 at 15° C. (59° F.).

It melts at 38° to 40° C. (100.4° to 104° F.) to a perfectly clear liquid, which is colorless in thin layers, and which should not separate an aqueous layer. At or below 30° C. (86° F.), it is a soft solid.

Distilled Water boiled with Lard should not acquire an alkaline reaction (absence of *alkalies*), nor should another portion be colored blue by iodine T.S. (absence of *starch*). A portion of the water, when filtered, acidulated with nitric acid, and treated with silver nitrate T.S., should not yield a white precipitate soluble in ammonia (absence of *chlorides*).

If 10 Gm. of Lard be dissolved in chloroform, and the solution mixed with 10 Cc. of alcohol and 1 drop of phenolphthalein T.S., it should not require more than 0.2 Cc. of normal potassium hydrate V.S. to produce a pink tint after strong shaking (limit of *free fatty acids*).

If 5 Cc. of melted and filtered Lard be, while warm, intimately mixed, by agitation, in a test-tube, with 5 Cc. of an alcoholic solution of silver nitrate (made by dissolving 0.1 Gm. of silver nitrate in 10 Cc. of deodorized alcohol and adding 2 drops of nitric acid), and the mixture then heated for five minutes in a water-bath, the liquid fat should not acquire a reddish or brown color, nor should any dark color be produced at the line of contact of the two liquids (absence of more than about 5 per cent. of *cotton-seed fats*).

Preparations: Adeps Benzoinatus. Ceratum. (Compound Cerates.) Unguentum.

ADEPS BENZOINATUS.

BENZOINATED LARD.

Lard, *one thousand grammes* 1000 Gm.

Benzoin, in coarse powder, *twenty grammes* 20 Gm.

Melt the Lard by means of a water-bath. Tie the Benzoin loosely in a piece of coarse muslin, suspend it in the melted Lard, and, stirring frequently, continue the heat for two hours, covering the vessel and not allowing the temperature to rise above 60° C. (140° F.). Lastly, having removed the Benzoin, strain the Lard, and stir occasionally while it cools.

When Benzoinated Lard is to be kept or used during warm weather, 5 per cent. (or more, if necessary) of the Lard should be replaced by White Wax.

ADEPS LANÆ HYDROSUS.

HYDROUS WOOL-FAT.

The purified fat of the wool of sheep (*Ovis Aries* Linné; class *Mammalia*; order *Ruminantia*), mixed with not more than 30 per cent. of water.

A yellowish-white or nearly white, ointment-like mass, having a faint, peculiar odor.

Insoluble in water, but miscible with twice its weight of the latter, without losing its ointment-like character. With ether or chloroform it yields turbid solutions which are neutral to litmus paper.

Hydrous Wool-Fat melts at about 40° C. (104° F.). When heated on a water-bath, it finally leaves a residue amounting to not less than 70 per cent., which is transparent while melted, and, when cold, appears as a yellow, tough, unctuous mass, completely soluble in ether or chloroform, and only partially soluble in alcohol.

A solution (1 in 50) of a portion of this mass in chloroform, when poured on the surface of concentrated sulphuric acid, gradually develops a deep brown color at the line of contact of the two layers.

When a portion of this mass is ignited, it should leave not more than 0.3 per cent. of ash, which should not have an alkaline reaction on litmus (absence of *alkalies*).

If 2 Gm. of the same mass are dissolved in 10 Cc. of ether, and mixed with 2 drops of phenolphthalein T.S., a colorless liquid results (absence of *free alkalies*), which should be decidedly reddened by 1 drop of normal potassium hydrate V.S. (absence of *free fatty acids*).

If 10 Gm. of Hydrous Wool-Fat be heated, together with 50 Cc. of water, on a water-bath, until the fat is melted, there should result an upper, translucent and light yellow, fatty layer, and a lower, clear, aqueous layer, which latter should not yield glycerin upon evaporation, and, when a portion of it is heated with some potassium or sodium hydrate T.S., it should not emit vapors of *ammonia*.

ÆTHER.

ETHER.

[ÆTHER FORTIOR, PHARM. 1880.]

A liquid composed of about 96 per cent., by weight, of absolute Ether or Ethyl Oxide [$(C_2H_5)_2O = 73.84$], and about 4 per cent. of Alcohol containing a little Water.

Ether should be kept in well-stoppered containers, preferably in tin cans, in a cool place, remote from lights or fire.

A transparent, colorless, mobile liquid, having a characteristic odor, and a burning and sweetish taste.

Specific gravity: 0.725 to 0.728 at 15° C. (59° F.); or 0.714 to 0.717 at 25° C. (77° F.).

Soluble in about 10 times its volume of water at 15° C. (59° F.), with slight contraction of volume. Miscible, in all proportions, with alcohol, chloroform, benzoin, benzol, fixed and volatile oils.

Ether boils at about 37° C. (98.6° F.), and it should, therefore, boil when a test-tube, containing some broken glass and half filled with it, is held for some time in the hand.

Ether is highly volatile and inflammable. Its vapor, when mixed with air and ignited, explodes violently.

The color of light blue litmus paper moistened with water should not be changed when the paper is immersed in Ether for ten minutes.

Upon evaporation, Ether should leave *no residue*.

If 10 Cc. of it be poured, in portions, upon clean, odorless blotting paper, and allowed to evaporate spontaneously, *no foreign odor* should become perceptible when the last traces of Ether leave the paper.

When 20 Cc. of Ether are shaken, in a graduated tube, with 20 Cc. of water, just previously saturated with Ether, the ethereal layer, upon separation, should not measure less than 19.8 Cc. (absence of an *undue amount of alcohol or water*).

If 10 Cc. of Ether be shaken occasionally, within one hour, with 1 Cc. of potassium hydrate T.S., no color should be developed in either liquid (absence of *aldehyde*, etc.).

Preparations: Spiritus Ætheris. Spiritus Ætheris Compositus.

ÆTHER ACETICUS.

ACETIC ETHER.

A liquid composed of about 98.5 per cent., by weight, of Ethyl Acetate [$C_2H_5C_2H_3O_2 = 87.8$], and about 1.5 per cent. of Alcohol containing a little Water.

It should be kept in well-stoppered bottles, in a cool and dark place, remote from lights or fire.

A transparent, colorless liquid, of a fragrant and refreshing, slightly acetous odor, and a peculiar acetous and burning taste.

Specific gravity : 0.893 to 0.895 at 15° C. (59° F.). Boiling point : about 76° C. (168.8° F.).

Soluble in about 8 parts of water at 15° C. (59° F.) ; miscible, in all proportions, with alcohol, ether, fixed and volatile oils.

Acetic Ether is readily volatilized, even at a low temperature. It is inflammable, burning with a yellowish flame and an acetous odor.

It is neutral to litmus paper.

When evaporated in a capsule, Acetic Ether should leave *no residue*.

If a portion be allowed to evaporate spontaneously from clean, odorless blotting paper, the final odor should not resemble that of pine-apples (absence of *butylic* and *amylic derivatives*).

When 25 Cc. of Acetic Ether are shaken, in a graduated tube, with 25 Cc. of water just previously saturated with the Ether, upon separation, the ethereal layer should not measure less than 24.5 Cc. (absence of an *undue proportion of alcohol or water*).

When a small portion of the Ether is carefully poured upon some concentrated sulphuric acid, no dark ring should be developed at the point of contact of the two layers (absence of *readily carbonizable, organic impurities*).

ALCOHOL.

ALCOHOL.

A liquid composed of about 91 per cent., by weight, or 94 per cent., by volume, of Ethyl Alcohol [$C_2H_5OH = 45.9$], and about 9 per cent., by weight, of Water.

Alcohol should be kept in well-closed vessels, in a cool place, remote from lights or fire.

A transparent, colorless, mobile, and volatile liquid, of a characteristic, rather agreeable odor, and a burning taste.

Specific gravity : about 0.820 at 15° C. (59° F.) ; or 0.812 at 25° C. (77° F.).

Miscible with water in all proportions, and without any trace of cloudiness ; also miscible with ether or chloroform.

It is readily volatilized even at low temperatures, and boils at 78° C. (172.4° F.). It is inflammable, and burns with a blue flame.

It should not affect the color of blue or red litmus paper previously moistened with water.

If 50 Cc. of Alcohol be evaporated in a clean glass vessel, no *color* or *weighable residue* should remain.

On allowing Alcohol, mixed with one-third of its volume of water, to evaporate spontaneously from clean, odorless blotting-paper saturated with it, no odor of *fusel oil*, nor *other foreign odor*, should become perceptible.

If 10 Cc. of Alcohol be mixed in a test-tube with 5 Cc. of potassium hydrate T.S., the liquid should not at once become dark-colored (absence of *aldehyde*, *methyl alcohol*, or *oak tannin*).

If 20 Cc. of Alcohol be shaken in a clean, glass-stoppered vial with 1 Cc. of silver nitrate T.S., the mixture should not become more than faintly opalescent, or acquire more than a faint brownish tint, when standing during six hours in diffused daylight (limit of *organic impurities*, *amylic alcohol*, etc.).

Preparation : Alcohol Dilutum.

ALCOHOL ABSOLUTUM.

ABSOLUTE ALCOHOL.



Ethyl Alcohol, containing not more than 1 per cent., by weight, of Water.

Absolute Alcohol should be kept in well-stoppered bottles or tin cans, in a cool place, remote from lights or fire.

A transparent, colorless, mobile, and volatile liquid, of a characteristic, rather agreeable odor, and a burning taste. Very hygroscopic.

Specific gravity : not higher than 0.797 at 15° C. (59° F.) ; or 0.789 at 25° C. (77° F.).

In other respects, Absolute Alcohol has the properties, and should respond to the reactions and tests, of Deodorized Alcohol (see *Alcohol Deodoratum*).

ALCOHOL DEODORATUM.

DEODORIZED ALCOHOL.

A liquid composed of about 92.5 per cent., by weight, or 95.1 per cent., by volume, of Ethyl Alcohol [$\text{C}_2\text{H}_5\text{OH} = 45.9$], and about 7.5 per cent., by weight, of Water.

Deodorized Alcohol should be kept in well-closed vessels, in a cool place, remote from lights or fire.

Specific gravity : about 0.816 at 15° C. (59° F.) ; or 0.808 at 25° C. (77° F.).

If 25 Cc. of Deodorized Alcohol be mixed with an equal volume of water and 5 Cc. of glycerin, and the mixture allowed to evaporate spontaneously from a piece of clean, odorless blotting paper, no *foreign odor* should become

perceptible when the last traces of the Alcohol leave the paper (absence of *fusel oil constituents*).

If 25 Cc. be allowed to evaporate spontaneously in a porcelain capsule carefully protected from dust, until only a moisture is left, no red or brown color should be produced upon the addition of a few drops of colorless, concentrated sulphuric acid (absence of *amylic alcohol*, or *non-volatile, carbonizable, organic impurities*, etc.).

In other respects, Deodorized Alcohol has the properties, and should respond to the reactions and tests, of *Alcohol*.

ALCOHOL DILUTUM.

DILUTED ALCOHOL.

A liquid composed of about 41 per cent., by weight, or about 48.6 per cent., by volume, of absolute Ethyl Alcohol [$C_2H_5OH = 45.9$], and about 59 per cent., by weight, of Water.

It should be kept in well-closed vessels, in a cool place, remote from lights or fire.

Alcohol, five hundred cubic centimeters 500 Cc.
Distilled Water, five hundred cubic centimeters 500 Cc.

Mix them.

If the two liquids be measured at the temperature of 15.6° C. (60° F.), the mixture, when cooled to the same temperature, will measure about 971 Cc.

Diluted Alcohol may also be prepared in the following manner:

Alcohol, four hundred and ten grammes 410 Gm.
Distilled Water, five hundred grammes 500 Gm.

Mix them.

Diluted Alcohol has a specific gravity of about 0.938 at 15° C. (59° F.), about 0.937 at 15.6° C. (60° F.), and about 0.930 at 25° C. (77° F.).

It should respond to the reactions and tests given under *Alcohol*.

Rules for making an Alcohol of any required lower Percentage, from an Alcohol of any given higher Percentage:

I. By Volume.—Designate the volume-percentage of the stronger alcohol by V , and that of the weaker alcohol by v .

Rule.—Mix v volumes of the stronger alcohol with pure water to make V volumes of product. Allow the mixture to stand until full contraction has taken place, and until it has cooled, then make up any deficiency in the V volumes by adding more water.

Example.—An alcohol of 30 per cent. by volume is to be made from an alcohol of 94 per cent. by volume.—Take 30 volumes of the 94 per cent. alcohol, and add enough pure water to produce 94 volumes.

II. By Weight.—Designate the weight-percentage of the stronger alcohol by W , and that of the weaker by w .

Rule.—Mix w parts by weight of the stronger alcohol with pure water to make W parts by weight of product.

Example.—An alcohol of 50 per cent. by weight is to be made from an alcohol of 91 per cent. by weight.—Take 50 parts by weight of the 91 per cent. alcohol, and add enough pure water to produce 91 parts by weight.

ALLIUM.**GARLIC.**

The bulb of *Allium sativum* Linné (nat. ord. *Liliaceæ*).

Bulb subglobular, compound, consisting of about eight compressed, wedge-shaped bulblets, which are arranged in a circle around the base of the stem, and covered by several dry, membranous scales. Odor pungent and disagreeable; taste warm and acrid.

Garlic should be used without having been dried.

Preparation: Syrupus Allii.

ALOE BARBADENSIS.**BARBADOES ALOES.**

[CURAÇAO ALOES.]

The inspissated juice of the leaves of *Aloe vera* (Linné) Webb (nat. ord. *Liliaceæ*).

In hard masses, orange-brown, opaque, translucent on the edges; fracture waxy or resinous, somewhat conchoidal; odor saffron-like; taste strongly bitter.

Mixed with alcohol and examined under the microscope, it exhibits numerous crystals. Mixed with nitric acid, it acquires a red color.

Barbadoes Aloes is not colored, or acquires only a light bluish-green tint, on being mixed with sulphuric acid and blowing the vapor of nitric acid over the mixture (difference from *Natal aloes*).

ALOE PURIFICATA.**PURIFIED ALOES.**

Socotrine Aloes, one thousand grammes..... 1000 Gm.

Alcohol, two hundred cubic centimeters 200 Cc.

Heat the Aloes, by means of a water-bath, until it is completely melted. Then add the Alcohol, and, having stirred the mixture thoroughly, strain it through a No. 60 sieve, which has just been dipped into boiling water. Evaporate the strained mixture by means of a water-bath, constantly stirring, until a thread of the mass becomes brittle on cooling. Lastly, break the product, when cold, into pieces of a convenient size, and keep it in well-stoppered bottles.

The product is in irregular, brittle pieces of a dull-brown or reddish-brown color, and having the peculiar, aromatic odor of Socotrine Aloes. It is almost entirely soluble in alcohol.

Preparations: Extractum Colocyntidis Compositum. Pilule Aloes. Pilule Aloes et Asafetidae. Pilule Aloes et Ferri. Pilule Aloes et Mastiches. Pilule Aloes et Myrrhæ. Pilule Rhei Compositæ. Tinctura Aloes. Tinctura Aloes et Myrrhæ. Tinctura Benzoini Composita.

ALOE SOCOTRINA.

SOCOTRINE ALOES.

The inspissated juice of the leaves of *Aloe Perryi* Baker (nat. ord. *Liliaceæ*).

In hard masses, occasionally soft in the interior, opaque, yellowish-brown, orange-brown or dark ruby-red, not greenish, translucent on the edges; fracture resinous, somewhat conchoidal. When breathed upon, it emits a fragrant saffron-like odor. Taste peculiar, strongly bitter.

Almost entirely soluble in alcohol and in 4 parts of boiling water. The aqueous solution becomes turbid on cooling and yields a deposit.

Mixed with alcohol and examined under the microscope, Socotrine Aloes exhibits numerous crystals.

The powder, on being thoroughly dried on a water-bath and then heated to 100° C., should not cake.

Mixed with nitric acid, it acquires a reddish-brown color.

Socotrine Aloes is not colored blue on being mixed with sulphuric acid and blowing the vapor of nitric acid over the mixture (difference from *Natal aloes*).

Preparations: Aloe Purificata. Extractum Aloes.

ALOINUM.

ALOIN.

A neutral principle obtained from several varieties of Aloes, chiefly Barbadoes Aloes (yielding Barbaloin); and Socotra or Zanzibar Aloes (yielding Socaloin),—differing more or less in chemical composition and physical properties according to the source from which it is derived.

Minute, acicular crystals, or a microcrystalline powder, varying in color from yellow to yellowish-brown, odorless or possessing a slight odor of aloes, of a characteristic, bitter taste, and permanent in the air.

Barbaloin is soluble, at 15° C. (59° F.), in about 60 parts of water, 20 parts of alcohol, or 470 parts of ether.

Socaloin is soluble in about 60 parts of water, 30 parts of absolute alcohol, 380 parts of ether, or 9 parts of acetic ether.

When heated, Aloin melts, and, on ignition, it is consumed without leaving a residue.

An alcoholic solution of Aloin is neutral to litmus paper.

An aqueous solution of Aloin is colored greenish-black by ferric chloride T.S., and slowly precipitated by basic lead acetate T.S.

On adding a minute portion of Barbaloin to a drop of cold nitric acid of specific gravity 1.200, on a white porcelain surface, a crimson color will be developed. Socaloin will produce scarcely any color when thus treated.

In alkaline solutions, Aloin is rapidly decomposed; in neutral or acid solutions, only slowly.

ALTHÆA.

ALTHÆA.

[MARSHMALLOW.]

The root of *Althæa officinalis* Linné (nat. ord. *Malvaceæ*).

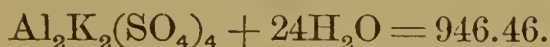
In cylindrical or somewhat conical pieces, from 10 to 15 Cm. long, 10 to 15 Min. in diameter, deeply wrinkled; deprived of the brown, corky layer and

small roots; externally white, marked with a number of circular spots, and of a somewhat hairy appearance from the loosened bast-fibres; internally whitish and fleshy. It breaks with a short, granular, and mealy fracture, has a faint, aromatic odor, and a sweetish, mucilaginous taste.

Preparation: Syrupus Althææ.

ALUMEN.

ALUM.



[POTASSIUM ALUM. ALUMINUM AND POTASSIUM SULPHATE.]

Large, colorless, octohedral crystals, sometimes modified by cubes, or in crystalline fragments, without odor, but having a sweetish and strongly astringent taste. On exposure to the air, the crystals are liable to absorb ammonia, and acquire a whitish coating.

Soluble in 9 parts of water at 15° C. (59° F.), and in 0.3 part of boiling water; it is also freely soluble in warm glycerin, but is insoluble in alcohol.

When gradually heated, it loses water; at 92° C. (197.6° F.) it melts, and if the heat be gradually increased to 200° C. (392° F.), it loses all its water of crystallization (45.52 per cent. of its weight), leaving a voluminous, white residue.

The salt has an acid reaction upon litmus paper.

The aqueous solution of the salt affords, with ammonia water, a white, gelatinous precipitate, which is nearly insoluble in an excess of ammonia.

Another portion of the aqueous solution yields, with barium chloride T.S., a white precipitate, insoluble in hydrochloric acid.

When a saturated solution of the salt is actively shaken with tartaric acid T.S., it affords, within half an hour, a white, crystalline precipitate.

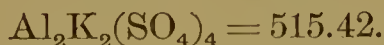
The aqueous solution of Alum affords, with potassium or sodium hydrate T.S., a white, gelatinous precipitate, which is completely soluble in an excess of the alkali, and this alkaline solution should not evolve the odor of ammonia, even when heated (distinction from, and absence of, *ammonium alum*).

A 5-per-cent. aqueous solution of the salt should not be affected by hydrogen sulphide T.S. (absence of *copper*, *lead*, or *zinc*), and 20 Cc. of this solution should not at once assume a blue color on the addition of 5 drops of potassium ferrocyanide T.S. (limit of *iron*).

Preparation: Alumen Exsiccatum.

ALUMEN EXSICCATUM.

DRIED ALUM.



[ALUMEN USTUM. BURNT ALUM.]

Alum, in small pieces, *one hundred grammes* 100 Gm.

To make *fifty-five grammes* 55 Gm.

Place the Alum in a shallow porcelain capsule so as to form a thin layer, and heat it on a sand-bath until it liquefies. Then continue the

application of a moderate heat, with constant stirring, until aqueous vapor ceases to be disengaged, and a dry, white, porous mass is obtained, weighing *fifty-five* (55) *grammes*. When cold, reduce the product to a fine powder, and preserve it in well-stoppered bottles.

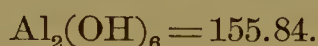
A white, granular powder, without odor, possessing a sweetish, astringent taste, and attracting moisture on exposure to the air.

It is very slowly but completely soluble in 20 parts of water at 15° C. (59° F.), and quickly soluble in 0.7 part of boiling water.

Its aqueous solution should respond to the reactions and tests of Alum (see *Alumen*).

ALUMINI HYDRAS.

ALUMINUM HYDRATE.



[ALUMINUM HYDROXIDE. HYDRATED ALUMINA.]

Alum, *one hundred grammes* 100 Gm.
Sodium Carbonate, *one hundred grammes* 100 Gm.
Distilled Water, *a sufficient quantity*.

Dissolve each salt separately in *one thousand* (1000) *cubic centimeters* of Distilled Water, filter each solution, and heat it to boiling. Then having poured the hot solution of Sodium Carbonate into a capacious vessel, gradually pour in the hot solution of Alum with constant stirring, and add an equal volume of boiling Distilled Water. Let the precipitate subside, decant the clear liquid, and pour upon the precipitate *two thousand* (2000) *cubic centimeters* of hot Distilled Water. Again decant, transfer the precipitate to a strainer, and wash it with hot Distilled Water, until the washings produce not more than a faint cloudiness with barium chloride T.S. Then allow it to drain, dry it at a temperature not exceeding 40° C. (104° F.), and reduce it to a uniformly fine powder.

A white, light, amorphous powder, odorless and tasteless, and permanent in dry air.

Insoluble in water or alcohol, but completely soluble in hydrochloric or sulphuric acid, and also in potassium or sodium hydrate T.S.

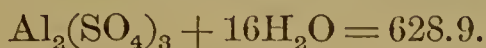
When heated to redness, it loses about 34.6 of its weight (water of hydration).

A solution of 1 Gm. of Aluminum Hydrate in 20 Cc. of diluted hydrochloric acid should not at once assume a blue color on the addition of 1 drop of potassium ferrocyanide T.S. (limit of *iron*), and should not give more than a faint cloudiness with barium chloride T.S. (limit of *sulphate*).

When dissolved in potassium or sodium hydrate T.S., it should yield no precipitate with hydrogen sulphide T.S. (absence of *zinc* or *lead*); and when boiled with 20 parts of water, and filtered, the filtrate should not leave more than a slight residue on evaporation (limit of *alkali salts*).

ALUMINI SULPHAS.

ALUMINUM SULPHATE.



A white, crystalline powder, without odor, having a sweetish and afterwards astringent taste, and permanent in the air.

Soluble in 1.2 parts of water at 15° C. (59° F.), and much more freely in boiling water, but insoluble in alcohol.

When gradually heated to about 200° C. (392° F.), it loses its water of crystallization (45.7 per cent. of its weight).

The salt has an acid reaction upon litmus paper.

The aqueous solution of the salt yields, with barium chloride T.S., a white precipitate insoluble in hydrochloric acid; and with potassium or sodium hydrate T.S., a white, gelatinous precipitate which is soluble in an excess of the alkali, but is again separated on the addition of a sufficient amount of ammonium chloride T.S.

A filtered, 10-per-cent. aqueous solution of the salt should not be affected by hydrogen sulphide T.S. (absence of *copper*, *lead*, or *zinc*), and should not become more than faintly opalescent within five minutes after the addition of an equal volume of decinormal sodium hyposulphite V.S. (limit of *free acid*).

20 Cc. of a 5-per-cent. aqueous solution of the salt should not at once assume a blue color on the addition of 5 drops of potassium ferrocyanide T.S. (limit of *iron*).

If 1 Gm. of the salt be gently heated with 5 Cc. of potassium or sodium hydrate T.S., the liquid should not evolve the odor of *ammonia*.

AMMONIACUM.

AMMONIAC.

A gum resin obtained from *Dorema Ammoniacum* Don (nat. ord. *Umbelliferæ*).

In roundish tears, from 2 to 6 Mm. or more in diameter; externally pale yellowish-brown, internally milk-white, brittle when cold, and breaking with a flat, conchoidal, and waxy fracture; or the tears are superficially united into irregular masses without any intervening, dark-colored substance. It has a peculiar odor, and a bitter, acid, and nauseous taste.

When triturated with water, it readily yields a milk-white emulsion.

Preparations: Emplastrum Ammoniaci cum Hydrargyro. Emulsum Ammoniaci.

AMMONII BENZOAS.

AMMONIUM BENZOATE.



Ammonium Benzoate should be kept in well-stoppered bottles.

Thin, white, four-sided, laminar crystals, odorless or having a slight odor of benzoic acid, a saline, bitter, afterwards slightly acid taste, and gradually losing ammonia on exposure to the air.

Soluble, at 15° C. (59° F.), in 5 parts of water, and in 28 parts of alcohol; in 1.2 parts of boiling water, and in 7.6 parts of boiling alcohol.

When strongly heated, the salt melts, emits vapors having the odor of ammonia and benzoic acid, and is finally completely dissipated.

The salt is neutral, or has a very slightly acid reaction upon litmus paper.

A saturated, aqueous solution of the salt affords, with ferric chloride T.S., a flesh-colored precipitate, and, when it is gently heated with potassium or sodium hydrate T.S., the odor of ammonia is evolved.

If diluted nitric acid be added to a 10-per-cent. aqueous solution of the salt, a precipitate of benzoic acid is produced, which, when thoroughly washed, should respond to the tests of purity mentioned under *Acidum Benzoicum*, and the filtrate from this precipitate should not be affected by barium chloride T.S. (absence of *sulphate*), or by silver nitrate T.S. (absence of *chloride*).

AMMONII BROMIDUM.

AMMONIUM BROMIDE.



Colorless, transparent, prismatic crystals, or a white, crystalline powder, odorless, of a pungent, saline taste, and permanent in the air.

Soluble, at 15° C. (59° F.), in 1.5 parts of water, and in 30 parts of alcohol; in 0.7 part of boiling water, and in 15 parts of boiling alcohol.

When heated, the salt volatilizes completely without melting.

The aqueous solution of the salt has a slightly acid reaction upon litmus paper.

When the aqueous solution is gently heated with potassium or sodium hydrate T.S., the odor of ammonia is evolved.

If to another portion of the solution a little chloroform be added, and subsequently a few drops of chlorine water, and the whole agitated, the chloroform will acquire a yellowish or yellowish-brown color without a violet tint.

If a few drops of diluted sulphuric acid be brought in contact with a little of the powdered salt on a porcelain plate, the salt should not at once assume a yellowish color (absence of *bromate*).

A 10-per-cent. aqueous solution should not be affected by hydrogen sulphide T.S. (absence of *metals*), nor by barium chloride T.S. (absence of *sulphate*).

20 Cc. of a 5-per-cent. aqueous solution of the salt should not at once assume a blue color on the addition of 5 drops of potassium ferrocyanide T.S. (limit of *iron*).

If 3 Gm. of the salt, dried at 100° C. (212° F.), be dissolved in water to the measure of 100 Cc., 10 Cc. of this solution, after the addition of a few drops of potassium chromate T.S., should require not more than 30.9 Cc. of decinormal silver nitrate V.S. to produce a permanent red coloration (absence of more than 1 per cent. of *ammonium chloride*).

AMMONII CARBONAS.

AMMONIUM CARBONATE.



Ammonium Carbonate should be kept in well-stoppered bottles, in a cool place.

White, hard, translucent, striated masses, having a strongly ammoniacal odor without empyreuma, and a sharp, saline taste. On exposure to the air, the salt loses both ammonia and carbonic acid, becoming opaque, and is finally converted into friable, porous lumps, or a white powder.

Slowly but completely soluble in about 5 parts of water at 15° C. (59° F.) ; decomposed by hot water with the elimination of carbonic acid and ammonia. By prolonged boiling with water the salt is completely dissipated. Alcohol dissolves the Carbamate [$\text{NH}_4\text{NH}_2\text{CO}_2$], and leaves the acid carbonate (ammonium bicarbonate).

When heated, the salt is completely volatilized, without charring.

The aqueous solution possesses a strongly alkaline reaction, and effervesces with acids.

A 5-per-cent. aqueous solution of the salt, slightly supersaturated with acetic acid, should not be affected by hydrogen sulphide T.S. (absence of *metals*), nor by barium chloride T.S. (*sulphate*), or ammonium oxalate T.S. (*calcium*).

A 5-per-cent. aqueous solution, on the addition of a slight excess of silver nitrate T.S., and subsequent supersaturation with nitric acid, should neither assume a brown color (absence of *hyposulphite*), nor become more than slightly opalescent within two minutes (limit of *chloride*).

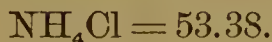
If 1 Gm. of the salt be slightly supersaturated with nitric acid, and the solution evaporated to dryness on a water-bath, it should afford a colorless and odorless residue which, upon gentle ignition, should be completely volatilized (absence of *empyreumatic* or *non-volatile matters*).

If 7.84 Gm. of unaltered Ammonium Carbonate be dissolved in water to the volume of 90 Cc., 30 Cc. of this solution (containing 2.613 Gm. of the salt) should require, for exact neutralization, *fifty* (50) *cubic centimeters* of normal sulphuric acid (each Cc. corresponding to 2 per cent. of the pure salt), rosolic acid being used as indicator.

Preparation: Spiritus Ammoniae Aromaticus.

AMMONII CHLORIDUM.

AMMONIUM CHLORIDE.



A white, crystalline powder, without odor, having a cooling, saline taste, and permanent in the air.

Soluble in 3 parts of water at 15° C. (59° F.), and in 1 part of boiling water, but almost insoluble in alcohol.

On ignition, the salt is completely volatilized, without charring.

The aqueous solution of the salt is neutral to litmus paper, and affords, with silver nitrate T.S., a white, curdy precipitate, which is soluble in ammonia water.

Another portion of the aqueous solution, when gently heated with potassium or sodium hydrate T.S., evolves the odor of ammonia.

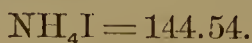
A 5-per-cent. aqueous solution of the salt should not be affected by hydrogen sulphide T.S. (absence of *metals*), barium chloride T.S. (*sulphate*), diluted sulphuric acid (*barium*), or ammonium oxalate T.S. (*calcium*).

When acidulated with hydrochloric acid, the solution should not assume a red color on the addition of a few drops of ferric chloride T.S. (absence of *sulphocyanate*).

20 Cc. of a 5-per-cent. aqueous solution of the salt should not at once assume a blue color on the addition of 5 drops of potassium ferrocyanide T.S. (limit of *iron*).

If to 1 Gm. of the salt a little nitric acid be added, and the mixture evaporated to dryness in a porcelain capsule on a water-bath, a white residue should be obtained which, when more strongly heated, should be completely volatilized (absence of *empyreumatic* or *non-volatile matters*).

Preparation: Trochisci Ammonii Chloridi.

AMMONII IODIDUM.**AMMONIUM IODIDE.**

Ammonium Iodide should be kept in small, well-stoppered vials, protected from light.

When deeply colored, the salt should not be dispensed, but it may be deprived of free iodine by adding to its concentrated aqueous solution sufficient ammonium sulphide T.S. to render it colorless, then filtering, and evaporating on a water-bath to dryness.

Minute, colorless, cubical crystals, or a white, granular powder, without odor when colorless, but emitting a slight odor of iodine when colored, and having a sharp, saline taste. The salt is very hygroscopic, and soon becomes yellow or yellowish-brown on exposure to the air and light, owing to the loss of ammonia and the elimination of iodine.

Soluble, at 15° C. (59° F.), in 1 part of water, and in 9 parts of alcohol; in 0.5 part of boiling water, and in 3.7 parts of boiling alcohol.

When heated on platinum foil, it evolves vapor of iodine, and volatilizes completely without melting.

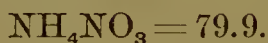
The aqueous solution of the salt is neutral to litmus paper, and, when gently heated with potassium or sodium hydrate T.S., evolves the odor of ammonia.

If a little chloroform be added to 10 Cc. of the aqueous solution, then a few drops of chlorine water, and the whole agitated, the chloroform will acquire a violet color.

A solution of 1 Gm. of the salt in 20 Cc. of water, acidulated with a few drops of diluted hydrochloric acid, should not afford an immediate cloudiness or precipitate with 5 drops of barium chloride T.S. (limit of *sulphate*).

A 1-per-cent. aqueous solution of the salt should not at once assume a blue color with potassium ferrocyanide T.S. (limit of *iron*), nor, after being mixed with a little starch T.S., should it assume a deep blue color (limit of *free iodine*).

If 0.25 Gm. of the salt be dissolved in 10 Cc. of ammonia water, the solution then shaken with 19 Cc. of decinormal silver nitrate V.S., and the filtrate supersaturated with 5 Cc. of nitric acid, no cloudiness should make its appearance within ten minutes (absence of more than about 0.5 per cent. of *chloride* or *bromide*).

AMMONII NITRAS.**AMMONIUM NITRATE.**

Ammonium Nitrate should be kept in well-stoppered bottles.

Colorless crystals, generally in the form of long, thin, rhombic prisms, or in fused masses, without odor, having a sharp, bitter taste, and somewhat deliquescent.

Soluble, at 15° C. (59° F.), in 0.5 part of water, and in 20 parts of alcohol; very soluble in boiling water, and in 3 parts of boiling alcohol.

When gradually heated, it melts at 165°–166° C. (329°–330.8° F.); at a temperature between 230° and 250° C. (446°–482° F.) it is decomposed into nitrogen monoxide gas and water, leaving no residue.

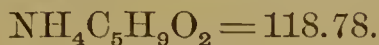
The aqueous solution of the salt is neutral to litmus paper, and, when gently heated with potassium or sodium hydrate T.S., it evolves the odor of ammonia.

On heating the salt with sulphuric acid, it emits nitrous vapors.

A 10-per-cent. aqueous solution of the salt, when acidulated with nitric acid, should not be affected by silver nitrate T.S. (absence of *chloride*), nor by barium chloride T.S. (absence of *sulphate*).

AMMONII VALERIANAS.

AMMONIUM VALERIANATE.



Ammonium Valerianate should be kept in well-stoppered bottles.

Colorless, or white, quadrangular plates, emitting the odor of valerianic acid, of a sharp and sweetish taste, and deliquescent in moist air.

Very soluble in water and in alcohol; also soluble in ether.

When heated, the salt fuses, gives off vapor of ammonia and of valerianic acid, and is finally completely volatilized.

The aqueous solution has an acid reaction, and, when gently heated with potassium or sodium hydrate T.S., it evolves the odor of ammonia.

If a concentrated, aqueous solution of the salt be slightly supersaturated with sulphuric acid, an oily layer of valerianic acid will separate on the surface.

A 5-per-cent. aqueous solution, when acidulated with nitric acid, should not be affected by barium nitrate T.S. (absence of *sulphate*), nor by silver nitrate T.S. (absence of *chloride*).

If a neutral solution of the salt be completely precipitated with ferric chloride T.S., the filtrate should not possess a deep red color (absence of *acetate*).

AMYGDALA AMARA.

BITTER ALMOND.

The seed of *Prunus Amygdalus*, var. *amara* De Candolle (nat. ord. *Rosaceæ*).

About 25 Mm. long, oblong-lanceolate, flattish, covered with a cinnamon-brown, scurfy testa, marked by about sixteen lines emanating from a broad scar at the blunt end. The embryo has the shape of the seed, is white, oily, consists of two plano-convex cotyledons, and a short radicle at the pointed end, and has a bitter taste.

When triturated with water, Bitter Almond yields a milk-white emulsion, which emits an odor of hydrocyanic acid.

Preparation: Syrupus Amygdalæ.

AMYGDALA DULCIS.

SWEET ALMOND.

The seed of *Prunus Amygdalus*, var. *dulcis* De Candolle (nat. ord. *Rosaceæ*).

Closely resembling the bitter almond (see *Amygdala Amara*), but having a bland, sweetish taste, free from rancidity.

When triturated with water, it yields a milk-white emulsion, free from the odor of hydrocyanic acid.

Preparations: Emulsum Amygdalæ. Syrupus Amygdalæ.

AMYL NITRIS.

AMYL NITRITE.

A liquid containing about 80 per cent. of Amyl (principally Iso-amyl) Nitrite [$C_5H_{11}NO_2 = 116.78$], together with variable quantities of undetermined compounds.

It should be kept in small, dark amber-colored and glass-stoppered vials, in a cool and dark place, remote from lights or fire.

A clear, yellow or pale yellow liquid, of a peculiar, ethereal, fruity odor, and a pungent, aromatic taste.

Specific gravity : 0.870–0.880 at 15° C. (59° F.).

Almost insoluble in water ; miscible, in all proportions, with alcohol or ether. In alcoholic solution it gradually decomposes with formation of ethyl nitrite and amylic alcohol.

It is very volatile, even at a low temperature, and is inflammable, burning with a fawn-colored flame. At about 96°–99° C. (204.8°–210.2° F.), it boils, yielding an orange-colored vapor.

If 1 Cc. of normal potassium hydrate V.S. and 10 Cc. of water be mixed with a drop of phenolphthalein T.S., then 5 Cc. of Amyl Nitrite added, and the tube inverted a few times, the red tint of the alkaline layer should still be perceptible (limit of *free acid*).

On shaking together equal volumes of Amyl Nitrite and potassium hydrate T.S., the aqueous layer should not acquire a deeper tint than pale yellow (limit of *aldehyde*).

Amyl Nitrite should remain transparent, or nearly so, when exposed to the temperature of melting ice (absence of *water*).

If 0.26 Gm. of Amyl Nitrite, diluted with about 5 Cc. of alcohol, be introduced into a nitrometer, followed by 10 Cc. of potassium iodide T.S., and afterwards by 10 Cc. of normal sulphuric acid V.S., the volume of nitric oxide generated, measured at the ordinary indoor temperature (assumed to be at or near 25° C., or 77° F.), should be about 40 Cc. (each Cc. indicating about 2 per cent. of pure Amyl Nitrite).

AMYLUM.

STARCH.

The fecula of the seed of *Zea Mays* Linné (nat. ord. *Gramineæ*).

In irregular, angular masses, which are easily reduced to a fine powder ; white, inodorous, and tasteless ; insoluble in ether, alcohol, or cold water. Under the microscope appearing as granules, nearly uniform in size, more or less angular in outline, with indistinct striæ and with a distinct hilum near the centre.

Triturated with cold water, it gives neither an acid nor an alkaline reaction with litmus paper.

When boiled with water, it yields a white jelly having a bluish tinge, which, when cool, acquires a deep blue color on the addition of iodine T.S.

When completely incinerated, Starch should leave not more than 1 per cent. of ash.

Preparation : Glyceritum Amyli.

ANISUM.

ANISE.

The fruit of *Pimpinella Anisum* Linné (nat. ord. *Umbelliferæ*).

About 4 or 5 Mm. long, ovate, compressed at the sides, grayish, finely hairy, and consisting of two mericarps, each with a flat face, and five light brownish, filiform ridges, and about fifteen thin oil-tubes, which can be seen in a transverse section by the microscope. It has an agreeable, aromatic odor, and a sweet, spicy taste.

It may be distinguished from Conium fruit (which it somewhat resembles, and which has been mistaken for it) by the odor and taste, and by the Conium fruit consisting usually of single mericarps, which are smooth, grooved upon the face, and have crenate ridges with wrinkles between them, and no oil-tubes.

ANTHEMIS.

ANTHEMIS.

[CHAMOMILE.]

The flower-heads of *Anthemis nobilis* Linné (nat. ord. *Compositæ*), collected from cultivated plants.

Heads subglobular, about 2 Cm. broad, consisting of an imbricated involucre, and numerous white, strap-shaped, three-toothed florets, and few or no yellow tubular disk florets, inserted upon a chaffy, conical, solid receptacle. It has a strong, agreeable odor, and an aromatic, bitter taste.

ANTIMONII ET POTASSII TARTRAS.

ANTIMONY AND POTASSIUM TARTRATE.



[TARTAR EMETIC. TARTARATED ANTIMONY.]

Antimony and Potassium Tartrate should be kept in well-stoppered bottles.

Colorless, transparent crystals of the rhombic system, becoming opaque and white on exposure to air; or a white, granular powder, without odor, and having a sweet, afterwards disagreeable, metallic taste.

Soluble in 17 parts of water at 15° C. (59° F.), and in 3 parts of boiling water, but insoluble in alcohol, which precipitates it from its aqueous solution in the form of a crystalline powder.

When heated to 110° C. (230° F.), the salt loses its water of crystallization (2.71 per cent.). When heated to redness, it chars, emits an odor resembling that of burning sugar, and leaves a blackened residue having an alkaline reaction.

The aqueous solution of the salt possesses a slightly acid reaction, and yields, with hydrochloric acid, a white precipitate soluble in an excess of the acid; but no precipitate occurs if tartaric acid had previously been added.

In a solution of the salt, acidulated with hydrochloric acid, hydrogen sulphide T.S. produces an orange-red precipitate.

The aqueous solution, even when largely diluted, at once becomes permanently turbid on the addition of a small quantity of potassium carbonate or calcium hydrate T.S.

A 1-per-cent. aqueous solution of the salt, acidulated with acetic acid, should not be affected by the addition of a few drops of barium chloride T.S. (absence of *sulphate*), silver nitrate T.S. (*chloride*), ammonium oxalate T.S. (*calcium*), or potassium ferrocyanide T.S. (*iron and other metals*).

On adding sodium carbonate T.S. to crushed crystals of the salt, effervescence should not ensue (absence of *potassium bitartrate*).

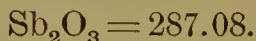
If 1 Gm. of the salt be dissolved, with the aid of heat, in hydrochloric acid, and to this solution 1 Cc. of stannous chloride T.S. be added (see List of Reagents, Bettendorff's Test for Arsenic), together with a small piece of pure tin-foil, no turbidity or coloration should ensue within one hour (limit of *arsenic*).

If 0.331 Gm. of the crystallized salt, or 0.322 Gm. of the salt dried at 110° C. (230° F.), be dissolved in 10 Cc. of water, and about 20 Cc. of a cold, saturated solution of sodium bicarbonate and a little starch T.S. added, it should require not less than 20 Cc. of decinormal iodine V.S. to produce a permanent blue color (corresponding to 100 per cent. of the pure salt).

Preparations: Syrupus Scillæ Compositus. Vinum Antimonii.

ANTIMONII OXIDUM.

ANTIMONY OXIDE.



[ANTIMONY TRIOXIDE.]

A heavy, grayish-white powder without odor or taste, and permanent in the air.

Almost insoluble in water, and insoluble in alcohol. Nitric acid fails to dissolve it, but it is readily soluble in hydrochloric acid without effervescence, and also in a warm solution of tartaric acid, or in a boiling solution of potassium bitartrate.

When heated, the oxide turns yellow, becoming white again on cooling, and at a dull red heat fuses to a yellowish liquid, which concretes, on cooling, to a crystalline mass of a pearly color. At a higher temperature it sublimes, producing colorless and transparent, or white, shining, needle-shaped crystals.

On dropping its solution in hydrochloric acid into water, a white precipitate is produced, which is at once changed to orange by hydrogen sulphide T.S.

If 1 Gm. of the Oxide be dissolved with the aid of 5 Gm. of tartaric acid in a little water, and the solution diluted with water to the measure of 100 Cc., portions of this solution should not be affected by test-solutions of silver nitrate (absence of *chloride*), barium chloride (*sulphate*), or potassium ferrocyanide (*iron and other metals*).

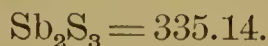
If a solution of the Oxide in hydrochloric acid be diluted with water, until it just begins to become permanently turbid, and then precipitated with hydrogen sulphide, this precipitate, when collected and thoroughly washed, should be completely soluble in ammonium sulphide T.S. (absence of *copper and lead*).

If 1 Gm. of the Oxide be dissolved in hydrochloric acid, and to this solution 1 Cc. of stannous chloride T.S. (see List of Reagents, Bettendorff's Test for Arsenic) be added, together with a small piece of pure tin-foil, no turbidity or coloration should ensue within one hour (limit of *arsenic*).

Preparation: Pulvis Antimonialis.

ANTIMONII SULPHIDUM.

ANTIMONY SULPHIDE.



[ANTIMONY TRISULPHIDE.]

Native Antimony Sulphide, purified by fusion, and as free from arsenic as possible.

Steel-gray masses of a metallic lustre and a striated, crystalline fracture, forming a black or grayish-black, lustreless powder, without odor or taste, and permanent in the air.

Insoluble in water or alcohol, but soluble in hydrochloric acid with the evolution of hydrogen sulphide.

At a temperature below a red heat, the Sulphide fuses to a dark brown liquid.

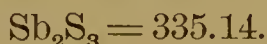
If 1 Gm. of the powdered Sulphide be digested and finally boiled with 10 Cc. of hydrochloric acid, it should dissolve without leaving more than 1 per cent. of residue.

This acid solution, completely deprived of hydrogen sulphide by boiling, yields, when added to water, a white precipitate, which is soluble in a solution of tartaric acid. After the separation of the precipitate by filtration, the filtrate yields an orange-red precipitate with hydrogen sulphide T.S.

Preparation: Antimonii Sulphidum Purificatum.

ANTIMONII SULPHIDUM PURIFICATUM.

PURIFIED ANTIMONY SULPHIDE.



[PURIFIED ANTIMONY TRISULPHIDE.]

Antimony Sulphide, *one hundred grammes* 100 Gm.

Ammonia Water, *fifty cubic centimeters* 50 Cc.

Water, *a sufficient quantity*.

Reduce the Antimony Sulphide to a very fine powder. Separate the coarser particles by elutriation, and, when the finely divided Sulphide has been deposited, pour off the water, add the Ammonia Water, and macerate for five days in a well-closed vessel, agitating the mixture frequently. Then let the powder settle, pour off the Ammonia Water, and wash the residue by repeated affusion and decantation of Water. Finally dry the product by the aid of a gentle heat.

A heavy, grayish-black, lustreless powder, without odor or taste, and permanent in the air.

Insoluble in water or alcohol, but soluble in hydrochloric acid with the evolution of hydrogen sulphide.

At a temperature below a red heat it fuses to a dark brown liquid.

If 1 Gm. of the Sulphide be digested, and finally boiled, with 10 Cc. of hydrochloric acid, it should dissolve without leaving more than 1 per cent. of residue.

This acid solution, completely deprived of hydrogen sulphide by boiling, yields, when added to water, a white precipitate, which is soluble in a solution of tartaric acid. After the separation of the precipitate by filtration, the filtrate yields an orange-red precipitate with hydrogen sulphide T.S.

If 2 Gm. of the Sulphide be mixed and cautiously ignited, in a porcelain crucible, with 8 Gm. of pure sodium nitrate, and, after cooling, the fused mass be boiled with 25 Cc. of water, there will remain a residue which should be white or nearly so, and not yellowish nor brownish (absence of *other metallic sulphides*).

On boiling the filtrate separated from the last-mentioned residue with a slight excess of nitric acid, until no more nitrous vapors are evolved, then dissolving in it 0.1 Gm. of silver nitrate, filtering again, if necessary, and cautiously pouring a few drops of ammonia water on top, not more than a white cloud, but no red or reddish precipitate, should appear at the line of contact of the two liquids (absence of more than about 0.1 per cent. of *arsenic*).

Preparation: Antimonium Sulphuratum.

ANTIMONIUM SULPHURATUM.

SULPHURATED ANTIMONY.

[KERMES MINERAL.]

Chiefly Antimony Trisulphide [$\text{Sb}_2\text{S}_3 = 335.14$], with a very small amount of Antimony Trioxide.

Purified Antimony Sulphide, *one hundred grammes* 100 Gm.
 Solution of Soda, *twelve hundred cubic centimeters* 1200 Cc.
 Distilled Water,
 Diluted Sulphuric Acid, *each, a sufficient quantity*.

Mix the Purified Antimony Sulphide with the Solution of Soda and *three thousand* (3000) *cubic centimeters* of Distilled Water, and boil the mixture over a gentle fire for two hours, with frequent stirring, and occasionally adding Distilled Water so as to preserve the same volume. Strain the liquid immediately through a double muslin strainer, and drop into it, while yet hot, Diluted Sulphuric Acid so long as it produces a precipitate. Wash the precipitate with hot Distilled Water until the washings are at most but very slightly clouded by barium chloride T.S.; then dry the precipitate at a temperature not exceeding 25° C. (77° F.), and rub it to a fine powder.

Keep the product in well-stoppered bottles, protected from light.

An amorphous, reddish-brown powder, becoming lighter in color on exposure to light, and having neither odor nor taste.

Insoluble in water or alcohol, but soluble in hydrochloric acid with the evolution of hydrogen sulphide.

When heated in a dry test-tube, it emits moisture and leaves a black residue.

If 1 Gm. of Sulphurated Antimony be gently heated with 10 Cc. of hydrochloric acid, it should dissolve, with the exception of a slight residue, which, when washed and dried, should burn on the application of a flame with the characteristic odor of sulphur, leaving not more than a scanty ash.

The acid solution, completely deprived of hydrogen sulphide by boiling, yields, when added to water, a white precipitate, which, after being washed and dried, should weigh not less than 85 per cent. of the original weight of the sulphide. The liquid filtered from this precipitate yields an orange-red precipitate with hydrogen sulphide T.S.

If 1 Gm. of Sulphurated Antimony be shaken with 20 Cc. of hot water, the filtrate should be neutral to test paper, should not be rendered more than slightly opalescent by barium chloride T.S. (limit of *sulphate*), or silver nitrate T.S. (limit of *chloride*), and should not be affected by ammonium oxalate T.S. (absence of *calcium*).

When tested for arsenic, as described under Purified Antimony Sulphide, it should afford no reaction beyond the limit prescribed for the latter.

Preparation: *Pilulæ Antimonii Compositæ*.

APOCYNUM.

APOCYNUM.

[CANADIAN HEMP.]

The root of *Apocynum cannabinum* Linné (nat. ord. *Apocynaceæ*).

Long, cylindrical, somewhat branched, 5 to 10 Mm. thick, gray or brownish-gray, longitudinally wrinkled and transversely fissured; brittle; fracture short, white; the bark rather thick; the wood porous, spongy, with delicate, medullary rays; inodorous; taste bitter, disagreeable.

Preparation: *Extractum Apocyni Fluidum*.

APOMORPHINÆ HYDROCHLORAS.

APOMORPHINE HYDROCHLORATE.



The hydrochlorate of an artificial alkaloid prepared from morphine or codeine.

It should be kept in small, dark amber-colored vials.

Minute, grayish-white, shining, acicular crystals, without odor, having a faintly bitter taste, and acquiring a greenish tint upon exposure to light and air.

Soluble, at 15° C. (59° F.), in about 45 parts of water, and about 45 parts of alcohol; very little soluble in ether or chloroform.

When heated to near 100° C. (212° F.), the salt is decomposed, rapidly if in solution, slowly when dry.

At 270° C. (518° F.) it fuses to a black mass, and, when ignited, it is consumed without leaving a residue.

The salt is neutral to litmus paper.

The crystals are colored blood-red to orange by nitric acid, transiently violet to light brown by sulphuric acid, dark purple to orange by a mixture of these acids.

On shaking a few Cc. of the saturated, aqueous solution of the salt with a few small particles of manganese dioxide, the liquid acquires a green color, which is turned reddish-brown by adding some crystals of oxalic acid.

If the oxalic acid be added to the solution first, and then a few small particles of manganese dioxide, the liquid will, upon agitation, assume a deep brownish-red color.

Silver nitrate T.S. added to the aqueous solution of the salt throws down a white precipitate, insoluble in nitric acid, soon turning black by reduction to metallic silver, or instantly reduced by addition of ammonia water.

Addition of sodium bicarbonate solution to the aqueous solution throws down the white amorphous alkaloid, which soon turns green on exposure to air, and imparts a violet or blue color to chloroform, in which it is very soluble (difference from *morphine*).

If the salt impart, at once, an emerald-green color to 100 parts of water on being shaken with it a few times in a test-tube, it should be rejected.

AQUA.

WATER.

$H_2O = 17.96.$

Natural Water in its purest attainable state.

A colorless, limpid liquid, without odor or taste at ordinary temperatures, and remaining odorless while being heated to boiling.

Water should be perfectly neutral to litmus paper, and its transparency should not be affected, nor should any color be imparted to it, by hydrogen sulphide T.S., or ammonium sulphide T.S. (absence of *metallic impurities*).

It should also remain unaffected by mercuric chloride T.S. (limit of *ammonia*).

On evaporating 1000 Cc. of Water on a water-bath, it should not leave a residue weighing more than 0.5 Gm. (limit of *soluble salts*), and this residue, when ignited, should not carbonize, nor evolve *ammoniacal* or *acid* vapors.

If 200 Cc. of Water be acidulated with hydrochloric acid and heated to boiling, and 0.5 Cc. of barium chloride T.S. added, the liquid, cooled and filtered, should give no further precipitate on the addition of a few drops of barium chloride T.S., even on standing (limit of *sulphates*).

If 200 Cc. of Water be acidulated with nitric acid, and 0.5 Cc. of decinormal silver nitrate V.S. be added, the filtered liquid should not be affected by the subsequent addition of a few drops of silver nitrate T.S. (limit of *chlorides*).

If 5 Cc. of Water mixed with a few drops of diphenylamine T.S. be carefully poured upon about 2 Cc. of sulphuric acid, free from nitrose, contained in a test-tube, so as to form a separate layer, no blue color should be formed at the line of contact of the two liquids (limit of *nitrites*).

If 100 Cc. of Water be acidulated with diluted sulphuric acid free from nitrose, and a few drops of zinc-iodide-starch T.S. subsequently added, the liquid should not at once assume a blue or violet color (absence of *nitrites*).

On heating 100 Cc. of Water, acidulated with 10 Cc. of diluted sulphuric acid, to boiling, and subsequently adding 0.5 Cc. of decinormal potassium permanganate V.S., the color of the liquid should not be completely destroyed by boiling it for ten minutes (limit of *organic* or *other oxidizable matters*).

Preparation: Aqua Destillata.

AQUA AMMONIÆ.

AMMONIA WATER.

An aqueous solution of Ammonia [$NH_3 = 17.01$] containing 10 per cent., by weight, of the gas.

Ammonia Water should be kept in glass-stoppered bottles, in a cool place.

A colorless, transparent liquid, having a very pungent odor, an acrid, alkaline taste, and a strongly alkaline reaction.

Specific gravity: 0.960 at 15° C. (59° F.).

It is completely volatilized by the heat of a water-bath.

On bringing a glass rod dipped into hydrochloric acid near the liquid, dense, white fumes are evolved.

On slightly supersaturating 10 Cc. of Ammonia Water with diluted sulphuric acid, no *empyreumatic odor* or *red color* should be developed, and if to this liquid 1 Cc. of centinormal potassium permanganate V.S. be added, the pink color should not be completely destroyed within ten minutes (absence of *readily oxidizable matters*).

If Ammonia Water be mixed with 4 times its volume of calcium hydrate T.S., it should not afford an immediate turbidity (only minute traces of *carbonic acid*); and if it be diluted with twice its volume of water, it should not be affected by ammonium oxalate T.S. (absence of *calcium*), nor should it be affected by hydrogen sulphide T.S. either before or after neutralization with hydrochloric acid (absence of *metallic impurities*).

If Ammonia Water be slightly supersaturated with nitric acid, it should not be affected by barium chloride T.S. (absence of *sulphates*), nor by silver nitrate T.S. (*chlorides*); and if a third portion of the acidulated liquid be evaporated on a water-bath to dryness, it should afford a colorless residue, which, on ignition, should be completely volatilized (absence of *coal-tar bases*, and of *fixed impurities*).

To neutralize 3.4 Gm. (3.54 Cc.) of Ammonia Water should require 20 Cc. of normal sulphuric acid (each Cc. corresponding to 0.5 per cent. of Ammonia), rosolic acid being used as indicator.

Preparations: Linimentum Ammoniaë. Spiritus Ammoniaë Aromaticus.

AQUA AMMONIÆ FORTIOR.

STRONGER AMMONIA WATER.

An aqueous solution of Ammonia [$\text{NH}_3 = 17.01$] containing 28 per cent., by weight, of the gas.

Stronger Ammonia Water should be kept in strong, glass-stoppered bottles, not completely filled, in a cool place.

A colorless, transparent liquid, having an excessively pungent odor, a very acrid and alkaline taste, and a strongly alkaline reaction.

Specific gravity: 0.901 at 15° C. (59° F.).

If Stronger Ammonia Water be diluted with twice its volume of water, it should respond to the reactions and tests described under Ammonia Water (see *Aqua Ammoniaë*).

To neutralize 1.7 Gm. (1.88 Cc.) of Stronger Ammonia Water should require 28 Cc. of normal sulphuric acid (each Cc. corresponding to 1 per cent. of ammonia), rosolic acid being used as indicator.

Preparation: Spiritus Ammoniaë.

AQUA AMYGDALÆ AMARÆ.

BITTER ALMOND WATER.

Oil of Bitter Almond, <i>one cubic centimeter</i>	1 Cc.
Distilled Water, <i>nine hundred and ninety-nine cubic centimeters</i>	999 Cc.

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Dissolve the Oil in the Distilled Water by agitation, and filter through a well-wetted filter.

AQUA ANISI.**ANISE WATER.**

Oil of Anise, <i>two cubic centimeters</i>	2 Cc.
Precipitated Calcium Phosphate, <i>four grammes</i>	4 Gm.
Distilled Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Triturate the Oil of Anise with the precipitated Calcium Phosphate, add the Water gradually, under constant trituration, and filter.

AQUA AURANTII FLORUM.**ORANGE FLOWER WATER.**

Stronger Orange Flower Water,
Distilled Water, of each, *one volume*.

Mix them immediately before use.

Preparation: Syrupus Aurantii Florum.

AQUA AURANTII FLORUM FORTIOR.**STRONGER ORANGE FLOWER WATER.**

[AQUA AURANTII FLORUM, PHARM. 1880. TRIPLE ORANGE FLOWER WATER.]

Water saturated with the volatile oil of fresh Orange Flowers, obtained as a by-product in the distillation of the Oil of Orange Flowers. It should be kept in loosely-stoppered bottles, in a dark place.

Stronger Orange Flower Water should be neutral to litmus paper, and possess a strong odor of fresh orange flowers.

It should be colorless and clear, or only faintly opalescent, not mucilaginous, and give no reaction with hydrogen sulphide T.S. or ammonium sulphide T.S. (absence of *metallic impurities*).

Preparation: Aqua Aurantii Florum.

AQUA CAMPHORÆ.**CAMPHOR WATER.**

Camphor, <i>eight grammes</i>	8 Gm.
Alcohol, <i>five cubic centimeters</i>	5 Cc.
Precipitated Calcium Phosphate, <i>five grammes</i>	5 Gm.
Distilled Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Triturate the Camphor with the Alcohol and Precipitated Calcium Phosphate, then with the Water gradually added, and filter.

AQUA CHLORI.

CHLORINE WATER.

An aqueous solution of Chlorine [$\text{Cl} = 35.37$], containing at least 0.4 per cent. of the gas.

Manganese Dioxide, <i>ten grammes</i>	10 Gm.
Hydrochloric Acid, <i>thirty-five cubic centimeters</i>	35 Cc.
Water, <i>seventy-five cubic centimeters</i>	75 Cc.
Distilled Water, <i>four hundred cubic centimeters</i>	400 Cc.

Place the Dioxide in a flask connected by a suitable tube with a small wash-bottle containing *fifty* (50) *cubic centimeters* of Water, and connect this with a bottle having a capacity of *one thousand* (1000) *cubic centimeters*, and containing *four hundred* (400) *cubic centimeters* of Distilled Water which has previously been boiled and allowed to cool. Add to the Dioxide in the generating flask the Hydrochloric Acid, previously diluted with *twenty-five* (25) *cubic centimeters* of Water, and, by means of a sand-bath, apply a gentle heat. Conduct the generated Chlorine through the Water contained in the wash-bottle into the bottle containing the Distilled Water, which should be loosely stopped with cotton and kept, during the operation, at a temperature of about 10°C . (50°F .). When the air has been entirely displaced by the gas, disconnect the bottle from the apparatus, and, having inserted the stopper, shake the bottle, loosening the stopper from time to time, until the gas ceases to be absorbed. If necessary, reconnect the bottle with the apparatus, and continue passing the gas and agitating, until the Distilled Water is saturated. Finally, pour the Chlorine Water into small, dark amber-colored, glass-stoppered bottles, which should be completely filled therewith, and keep them in a dark and cool place.

Chlorine Water, even when kept from light and air, is apt to deteriorate. When it is required of full strength, it should be freshly prepared.

A clear, greenish-yellow liquid, having the suffocating odor and disagreeable taste of Chlorine, and leaving no residue on evaporation.

It instantly decolorizes dilute solutions of litmus, indigo, and other vegetable coloring matters.

When shaken with an excess of mercury until the odor of Chlorine has disappeared, the remaining liquid should be at most but faintly acid (limit of *hydrochloric acid*).

On adding 17.7 Gm. of Chlorine Water to a solution of 1 Gm. of potassium iodide in 10 Cc. of water, the resulting deep-red liquid should require for complete decoloration not less than 20 Cc. of decinormal sodium hyposulphite V.S. (corresponding to at least 0.4 per cent. of Chlorine).

AQUA CHLOROFORMI.**CHLOROFORM WATER.**

Chloroform,

Distilled Water, each, *a sufficient quantity.*

Add enough Chloroform to a convenient quantity of Distilled Water, contained in a dark amber-colored bottle, to maintain a slight excess of the former, after the contents have been repeatedly and thoroughly agitated.

When Chloroform Water is required for use, pour off the needed quantity of the solution, refill the bottle with Distilled Water and saturate it by thorough agitation, taking care that there be always an excess of Chloroform present.

AQUA CINNAMOMI.**CINNAMON WATER.**

Oil of Cinnamon, <i>two cubic centimeters</i>	2 Cc.
Precipitated Calcium Phosphate, <i>four grammes</i>	4 Gm.
Distilled Water, <i>a sufficient quantity,</i>	

To make <i>one thousand cubic centimeters</i>	1000 Cc.
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Triturate the Oil of Cinnamon with the Precipitated Calcium Phosphate, add the Distilled Water gradually, under continued trituration, and filter.

AQUA CREOSOTI.**CREOSOTE WATER.**

Creosote, <i>ten cubic centimeters</i>	10 Cc.
Distilled Water, <i>nine hundred and ninety cubic centimeters</i>	990 Cc.

To make <i>one thousand cubic centimeters</i>	1000 Cc.
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Agitate the Creosote vigorously with the Distilled Water, and filter through a well-wetted filter.

AQUA DESTILLATA.**DISTILLED WATER.**

$$\text{H}_2\text{O} = 17.96.$$

Water, <i>one thousand volumes</i>	1000 Vol.
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To make <i>eight hundred volumes</i>	800 Vol.
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Distil the Water from a suitable apparatus provided with a block-tin or glass condenser. Collect the first *one hundred (100) volumes*, and

throw this portion away. Then collect *eight hundred* (800) *volumes* and keep the Distilled Water in glass-stoppered bottles, rinsed with hot distilled water immediately before being filled.

A colorless, limpid liquid, without odor or taste, and perfectly neutral to litmus paper.

The transparency of Distilled Water should not be affected, nor should any color be imparted to it, by test-solutions of hydrogen sulphide or ammonium sulphide (absence of *metallic impurities*), or by those of barium chloride (*sulphates*), silver nitrate (*chlorides*), ammonium oxalate (*calcium*), or mercuric chloride (*ammonia*); nor should its transparency be affected when mixed with twice its volume of calcium hydrate T.S. (absence of *carbonic acid*).

It should give no reaction for nitrates or nitrites when tested as described under Water (see *Aqua*).

When 1000 Cc. of Distilled Water are evaporated on a water-bath to dryness, *no residue* should remain.

On heating 100 Cc. of Distilled Water, acidulated with 10 Cc. of diluted sulphuric acid, to boiling, and subsequently adding 1 Cc. of centinormal potassium permanganate V.S., the color of the liquid should not be completely destroyed by boiling for ten minutes, nor by afterwards setting the vessel aside, well covered, for ten hours (absence of *organic or other oxidizable matters*).

AQUA FÆNICULI.

FENNEL WATER.

Oil of Fennel, <i>two cubic centimeters</i>	2 Cc.
Precipitated Calcium Phosphate, <i>four grammes</i>	4 Gm.
Distilled Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Triturate the Oil of Fennel with the Precipitated Calcium Phosphate, add the Distilled Water gradually, under continued trituration, and filter.

AQUA HYDROGENII DIOXIDI.

SOLUTION OF HYDROGEN DIOXIDE.

[SOLUTION OF HYDROGEN PEROXIDE.]

A slightly acid, aqueous solution of Hydrogen Dioxide [$\text{H}_2\text{O}_2 = 3.92$], containing, when freshly prepared, about 3 per cent., by weight, of the pure Dioxide, corresponding to about 10 volumes of available oxygen.

Barium Dioxide, <i>three hundred grammes</i>	300 Gm.
Phosphoric Acid,	
Diluted Sulphuric Acid,	
Distilled Water, each, <i>a sufficient quantity</i> .	

Pour *five hundred* (500) *cubic centimeters* of cold Distilled Water into a suitable bottle, add to it the Barium Dioxide in such a way that it shall not form lumps, and shake vigorously so that a uniform mixture

may result. Provide suitable means of refrigeration, so that the bottle and contents may be kept at a temperature below 10° C. (50° F.), and shake it thoroughly every few minutes during half an hour. Afterwards, continuing the refrigeration, shake it occasionally, but vigorously, until the Dioxide has become fully hydrated, which may be recognized from the fact that only a small portion of the water separates from it on standing, and that it may be mixed with the separated water without great effort by shaking. Having introduced *ninety-six* (96) *cubic centimeters* of Phosphoric Acid into a bottle having the capacity of about *two thousand* (2000) *cubic centimeters*, add to it *three hundred and twenty* (320) *cubic centimeters* of Distilled Water, cool the mixture, and remove *fifty* (50) *cubic centimeters* as a reserved portion. Now add the well-mixed magma, in about four portions, to the acid liquid, and mix them intimately by vigorous and continuous shaking, cooling the bottle after each addition of magma. From time to time test the reaction of the liquid, and, when it becomes alkaline, add to it, cautiously, a little of the reserved Phosphoric Acid, until the liquid has again acquired an acid character. Repeat the agitation from time to time, and also the cautious addition of Phosphoric Acid, as long as the liquid becomes alkaline on prolonged, vigorous shaking. If necessary, a further quantity of Phosphoric Acid should be diluted with Distilled Water, in the proportion above given, and a portion of this liquid used for saturation. Having finally shaken the bottle again very thoroughly, and until the liquid part is neutral to litmus paper, set it aside until the precipitate occupies only about one-third of the volume of the contents, and pour the supernatant liquid upon a wetted, double, rapidly-acting, white filter, of a diameter of thirty centimeters. Then transfer the semi-liquid precipitate to the filter, rinse the bottle with *one hundred* (100) *cubic centimeters* of Distilled Water, transfer this to the filter, and when the liquid has drained off, wash the barium phosphate on the filter with Distilled Water, until the filtrate measures *one thousand* (1000) *cubic centimeters*. Now add to it, first, *twenty* (20) *drops*, and afterwards, if necessary, further, smaller quantities of Diluted Sulphuric Acid, until a small portion of the liquid, after filtration (which may be assisted by a little starch), is no longer rendered cloudy by Diluted Sulphuric Acid. Mix the cloudy liquid with about *ten* (10) *grammes* of starch by agitation, so that the starch may be thoroughly distributed throughout the liquid, and then filter it through a well-wetted, white filter of a diameter of twenty-five centimeters, returning the first portions until it runs through clear. When all the liquid has passed, ascertain the percentage of Hydrogen Dioxide contained in it by the method of assay

given below, and dilute the remaining liquid if necessary, so that it will contain 3 per cent. of absolute Hydrogen Dioxide.

Keep the product in loosely-stoppered bottles, in a cool place.

Since Solution of Hydrogen Dioxide will gradually diminish in strength, even when carefully kept, it should either be freshly made when wanted, or be kept on hand only in such quantity as will probably be consumed within a short time. Any Solution which has become weaker need not, for this reason, be thrown away, but may be reserved for an occasion when a weaker or diluted solution is prescribed or demanded. Or it may be employed, when making a fresh supply, as a diluent of the stronger solution.

A colorless liquid, without odor, slightly acidulous to the taste, and producing a peculiar sensation and soapy froth in the mouth; liable to deteriorate by age, exposure to heat, or protracted agitation.

Specific gravity: about 1.006 to 1.012 at 15° C. (59° F.).

When exposed to the air at the ordinary temperature, or when heated on a water-bath at a temperature not exceeding 60° C. (140° F.), the solution loses chiefly water. When rapidly heated, it is liable to decompose suddenly.

Solution of Hydrogen Dioxide has an acid reaction, due to a small amount of free acid purposely allowed to remain in it for preservation.

On adding to 10 Cc. of water, in a test-tube, 1 drop of potassium chromate T.S., then 10 drops of diluted sulphuric acid, and pouring a few Cc. of ether on top, the subsequent addition of a few drops of Solution of Hydrogen Dioxide, even when considerably diluted, will cause a blue color to appear at the zone of contact of the two liquids. After shaking, the ethereal layer will separate with a blue color.

Upon evaporating 50 Cc. of the Solution to dryness, on a water-bath, not more than 0.25 Gm. of residue should remain.

Upon evaporating 50 Cc. of the Solution, previously rendered alkaline by sodium hydrate T.S., to dryness, transferring the dry residue to a watch-glass, moistening it with sulphuric acid, and setting the glass in a moderately warm place for a few hours, the surface of the glass, after being washed, should exhibit no sign of corrosion (absence of *hydrofluoric acid*).

50 Cc. of the Solution should not require more than 0.5 Cc. of potassium hydrate V.S. to render the liquid alkaline, phenolphthalein being used as indicator (limit of *free acid*).

The addition of a few drops of diluted sulphuric acid to 10 Cc. of the Solution should produce no turbidity or precipitate (absence of *barium*).

Valuation of Solution of Hydrogen Dioxide.—Dilute 10 Cc. of the Solution with water to make 100 Cc. Transfer 17 Cc. of this liquid (containing 1.7 Cc. of the Solution) to a beaker, add 5 Cc. of diluted sulphuric acid, and then, from a burette, decinormal potassium permanganate V.S., until the liquid just retains a faint pink tint after being stirred. Each Cc. of the decinormal potassium permanganate V.S. corresponds to 0.0017 Gm. of absolute Hydrogen Dioxide.

To express the strength of any Solution of Hydrogen Dioxide approximately in *volumes of available oxygen* (that is, in volumes of oxygen, given off by 1 volume of the Solution upon decomposition), multiply the number of Cc. of decinormal permanganate V.S. decolorized by 1 Cc. of the Solution, by 0.56 (0.5594); or those decolorized by 1.7 Cc. of the Solution, by 0.33. (It is assumed that 1000 Cc. of oxygen, at 0° C. (32° F.) and 760 Mm. pressure, weigh 1.43 Gm.)

To express the strength in *percentage (by weight) of absolute Hydrogen Dioxide*, multiply the number of Cc. of decinormal permanganate V.S. decolorized by 1 Cc. of it, by 0.17; or divide the number of Cc. of permanganate V.S. decolorized by 1.7 Cc. of it, by 10.

AQUA MENTHÆ PIPERITÆ.**PEPPERMINT WATER.**

Oil of Peppermint, <i>two cubic centimeters</i>	2 Cc.
Precipitated Calcium Phosphate, <i>four grammes</i>	4 Gm.
Distilled Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Triturate the Oil of Peppermint with the Precipitated Calcium Phosphate, add the Distilled Water gradually, under constant trituration, and filter.

AQUA MENTHÆ VIRIDIS.**SPEARMINT WATER.**

Oil of Spearmint, <i>two cubic centimeters</i>	2 Cc.
Precipitated Calcium Phosphate, <i>four grammes</i>	4 Gm.
Distilled Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Triturate the Oil of Spearmint with the Precipitated Calcium Phosphate, add the Distilled Water gradually, under constant trituration, and filter.

AQUA ROSÆ.**ROSE WATER.**

Stronger Rose Water,
Distilled Water, of each, *one volume*.

Mix them immediately before use.

Preparation: Unguentum Aquæ Rosæ.

AQUA ROSÆ FORTIOR.**STRONGER ROSE WATER.**

[AQUA ROSÆ, PHARM. 1880. TRIPLE ROSE WATER.]

Water saturated with the volatile oil of Rose petals, obtained as a by-product in the distillation of Oil of Rose.

Stronger Rose Water should be kept in well-stoppered bottles, in a dark place.

Stronger Rose Water should be colorless and clear, not mucilaginous, and give no reaction with hydrogen sulphide or ammonium sulphide T.S. (absence of *metallic impurities*).

Preparation: Aqua Rosæ.

ARGENTI CYANIDUM.**SILVER CYANIDE.**

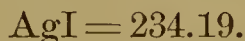
Silver Cyanide should be kept in dark amber-colored vials, protected from light.

A white powder, without odor or taste, permanent in dry air, but gradually turning brown on exposure to light.

Insoluble in water, alcohol, or cold nitric acid, but soluble in boiling nitric acid with evolution of hydrocyanic acid; also soluble in ammonia water and in solution of sodium hyposulphite, or of potassium cyanide.

When heated, the salt fuses, gives off cyanogen gas, and, on ignition, leaves a residue of metallic silver, amounting to 80.56 per cent. of its original weight.

Preparation: Acidum Hydrocyanicum Dilutum.

ARGENTI IODIDUM.**SILVER IODIDE.**

Silver Iodide should be kept in dark amber-colored vials, protected from light.

A heavy, amorphous, light yellowish powder, unaltered by light, if pure, but generally becoming somewhat greenish-yellow, and having neither odor nor taste.

Insoluble in water, alcohol, diluted acids, or in solution of ammonium carbonate, but soluble in about 2500 parts of stronger ammonia water. It is also dissolved by an aqueous solution of potassium cyanide, and by a concentrated solution of potassium iodide, and the resulting solutions yield a black precipitate with hydrogen sulphide T.S. or ammonium sulphide T.S.

When heated to about 400° C. (752° F.), the salt melts to a dark red liquid, which, on cooling, congeals to a soft, yellow, slightly transparent mass.

When mixed with ammonia water, it turns white, but regains its yellowish color upon being washed with water.

If a small quantity of chlorine water be agitated with an excess of the salt, the filtrate acquires a dark blue color on the addition of starch T.S.

If 0.5 Gm. of the salt be digested for five minutes with 10 Cc. of a cold 15-per-cent. solution of ammonium carbonate, the filtrate, when supersaturated with nitric acid, should not be rendered more than faintly opalescent (absence of *chloride*).

On digesting a portion of the salt—which has been found to be free from chloride, or from which the latter has been completely removed by repeated digestion with ammonium carbonate—for five minutes with 10 Cc. of ammonia water, and supersaturating the filtrate with nitric acid, only a slight opalescence, but no yellowish-white precipitate, should be produced (absence of *bromide*).

ARGENTI NITRAS.**SILVER NITRATE.**

Silver Nitrate should be kept in dark amber-colored vials, protected from light.

Colorless, transparent, tabular, rhombic crystals, becoming gray or grayish-black on exposure to light in presence of organic matter; without odor, but having a bitter, caustic, and strongly metallic taste.

Soluble, at 15° C. (59° F.), in 0.6 part of water, and in 26 parts of alcohol; in 0.1 part of boiling water, and in 5 parts of boiling alcohol.

When heated to about 200° C. (392° F.), the salt melts, forming a faintly yellow liquid, which, on cooling, congeals to a pure white, crystalline mass. At a higher temperature it is gradually decomposed with evolution of nitrous vapors.

An aqueous solution of the salt is neutral to litmus paper, and yields, with hydrochloric acid, a white precipitate, which is readily dissolved, without color (absence of *copper*), by ammonia water.

If 5 Cc. of a 10-per-cent. aqueous solution of the salt be mixed with 20 Cc. of diluted sulphuric acid, and heated to boiling, no turbidity should be perceptible (absence of *lead*).

If another portion of the aqueous solution be completely precipitated by hydrochloric acid, and the filtrate evaporated to dryness, no residue should be left (absence of *foreign salts*).

0.34 (0.3391) Gm. of Silver Nitrate, dissolved in 10 Cc. of water, should require, for complete precipitation, 20 Cc. of decinormal sodium chloride V.S. (corresponding to 100 per cent. of the pure salt).

Preparations: Argenti Nitras Dilutus. Argenti Nitras Fusus.

ARGENTI NITRAS DILUTUS.

DILUTED SILVER NITRATE.

[MITIGATED CAUSTIC.]

“ Silver Nitrate, *thirty grammes* 30 Gm.
Potassium Nitrate, *sixty grammes* 60 Gm.

Melt the salts together in a porcelain crucible, at as low a temperature as possible, stirring the melted mass well until it flows smoothly. Then cast it into suitable moulds.

Keep the product in dark amber-colored vials.

A white, hard solid, generally in the form of pencils or cones of a finely granular fracture, becoming gray or grayish-black on exposure to light in presence of organic matter; odorless, having a caustic, metallic taste, and neutral to litmus paper.

Each of its constituents retains the solubility in water and in alcohol mentioned, respectively, under *Argenti Nitras* and *Potassii Nitras*.

An aqueous solution of Diluted Silver Nitrate yields, with a slight excess of hydrochloric acid, a white precipitate, which is readily soluble in ammonia water. The filtrate from this precipitate, when evaporated to dryness, yields a white residue which is completely soluble in water, and this solution affords a yellow, crystalline precipitate with platinic chloride T.S., and a white, crystalline precipitate with sodium bitartrate T.S.

If to an aqueous solution of Diluted Silver Nitrate a slight excess of ammonia water be added, it should neither assume a blue color (absence of *copper*), nor show any turbidity (absence of *lead* and *bismuth*).

If 1 Gm. of Diluted Silver Nitrate, dissolved in 10 Cc. of water, be mixed with 20 Cc. of decinormal sodium chloride V.S. and a few drops of potassium chromate T.S., not more than 0.5 Cc. of decinormal silver nitrate V.S. should be required to impart to the liquid a permanent red color (corresponding to at least 33 per cent. of pure silver nitrate).

ARGENTI NITRAS FUSUS.

MOULDED SILVER NITRATE.

[LUNAR CAUSTIC.]

Silver Nitrate, *one hundred grammes*..... 100 Gm.

Hydrochloric Acid, *four grammes*..... 4 Gm.

To the Silver Nitrate, contained in a porcelain capsule, add the Hydrochloric Acid, and melt the mixture at as low a temperature as possible. Stir well, and pour the melted mass into suitable moulds.

Keep the product in dark amber-colored vials, protected from light.

A white, hard solid, generally in the form of pencils or cones of a fibrous fracture, becoming gray or grayish-black on exposure to light in the presence of organic matter, odorless, and having a bitter, caustic, and strongly metallic taste.

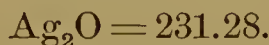
Soluble, at 15° C. (59° F.), with the exception of about 5 per cent. of silver chloride, in 0.6 part of water, and in 26 parts of alcohol; in 0.1 part of boiling water, and in 5 parts of boiling alcohol. The portion left undissolved by water should be completely soluble in ammonia water.

A clear, aqueous solution of the salt, decanted from the insoluble portion, should be neutral to litmus paper, and should respond to the tests of identity and purity mentioned under *Argenti Nitrates*.

If 0.34 Gm. of Moulded Silver Nitrate, dissolved as completely as possible in 10 Cc. of water, be mixed with 20 Cc. of decinormal sodium chloride V.S. and a few drops of potassium chromate T.S., not more than 1 Cc. of decinormal silver nitrate V.S. should be required to impart to the liquid a permanent red color (corresponding to 95 per cent. of pure silver nitrate).

ARGENTI OXIDUM.

SILVER OXIDE.



Silver Oxide should be kept in dark amber-colored vials.

It should not be triturated with readily oxidizable or combustible substances, and should not be brought in contact with ammonia.

A heavy, dark brownish-black powder, liable to reduction by exposure to light, odorless, and having a metallic taste.

Very slightly soluble in water, to which it imparts an alkaline reaction, and insoluble in alcohol, but readily and completely soluble in nitric acid without effervescence (absence of *carbonate*).

When heated to about 250° to 300° C. (482° to 572° F.), it is rapidly decomposed, with the evolution of oxygen, and leaving a residue of metallic silver.

The solution of the oxide in nitric acid should be colorless, and should respond to the reactions and tests mentioned under Silver Nitrate (see *Argenti Nitrates*).

If 0.5 Gm. of the Oxide be ignited in a porcelain crucible, it should yield 0.465 Gm. (or 93.1 per cent.) of metallic silver.

ARNICÆ FLORES.**ARNICA FLOWERS.**

The flower heads of *Arnica montana* Linné (nat. ord. *Compositæ*).

Heads about 3 Cm. broad, depressed-roundish, consisting of a scaly involucre in two rows, and a small, nearly flat, hairy receptacle, bearing about sixteen yellow, strap-shaped, ten-nerved ray-florets, and numerous yellow, five-toothed, tubular disk-florets, having slender, spindle-shaped achenes, crowned by a hairy pappus. Odor feeble, aromatic; taste bitter and acrid.

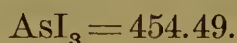
Preparation: Tinctura Arnicæ Florum.

ARNICÆ RADIX.**ARNICA ROOT.**

The rhizome and roots of *Arnica montana* Linné (nat. ord. *Compositæ*).

Rhizome about 5 Cm. long, and 3 or 4 Mm. thick; externally brown, rough from leaf-scars; internally whitish, with a rather thick bark, containing a circle of resin-cells, surrounding the short, yellowish wood-wedges, and large, spongy pith. The roots numerous, thin, fragile, grayish-brown, with a thick bark containing a circle of resin-cells. Odor somewhat aromatic; taste pungently aromatic and bitter.

Preparations: Extractum Arnicæ Radicis. Extractum Arnicæ Radicis Fluidum. Tinctura Arnicæ Radicis.

ARSENI IODIDUM.**ARSENIC IODIDE.**

Arsenic Iodide should be kept in glass-stoppered vials, in a cool place, protected from light.

Glossy, orange-red, crystalline masses, or shining, orange-red, crystalline scales, having an iodine-like odor and taste, and gradually losing iodine on exposure to air and light.

Soluble, at 15° C. (59° F.), in 7 parts of water, and in about 30 parts of alcohol; also soluble in ether, and in carbon disulphide. The salt is gradually decomposed by boiling water, and by boiling alcohol.

By heat it is completely volatilized; and if it be heated with diluted nitric acid, vapor of iodine will be evolved.

The aqueous solution of the salt has a yellow color, is neutral to litmus paper, and, on standing, gradually decomposes into arsenous and hydriodic acids.

On adding hydrogen sulphide T.S. to the solution acidulated with hydrochloric acid, a lemon-yellow precipitate is produced.

Preparation: Liquor Arseni et Hydrargyri Iodidi.

ASAFŒTIDA.**ASAFETIDA.**

A gum-resin obtained from the root of *Ferula fætida* (Bunge) Regel (nat. ord. *Umbelliferae*).

In irregular masses composed of whitish tears, which are imbedded in a yellowish-gray or brownish-gray, sticky mass. The tears, when hard, break with a conchoidal fracture, showing a milk-white color, which changes gradually, on exposure, to pink, and finally to brown. It has a persistent, alliaceous odor, and a bitter, alliaceous, acrid taste.

When triturated with water, it yields a milk-white emulsion, which becomes yellow on the addition of ammonia water.

It is partly soluble in ether, and at least 60 per cent. of it should dissolve in alcohol.

Preparations: Emulsum Asafoetidæ. Pilulæ Aloes et Asafoetidæ. Pilulæ Asafoetæ. Tinctura Asafoetidæ.

ASCLEPIAS.

ASCLEPIAS.

[PLEURISY ROOT.]

The root of *Aselepias tuberosa* Linné (nat. ord. *Aselepiadææ*).

Root large and fusiform, dried in longitudinal or transverse sections, from 2 to 15 Cm. long, and about 2 Cm. or more in thickness; the head knotty, and slightly but distinctly annulate, the remainder longitudinally wrinkled, externally orange-brown, internally whitish; tough, and having an uneven fracture; bark thin, and in two distinct layers, the inner one whitish; wood yellowish, with large, white, medullary rays. It is inodorous, and has a bitterish, somewhat acrid taste.

When long kept it acquires a gray color.

Preparation: Extractum Asclepiadis Fluidum.

ASPIDIUM.

ASPIDIUM.

[MALE FERN.]

The rhizome of *Dryopteris Filix-mas* Schott, and of *Dryopteris marginalis* Asa Gray (nat. ord. *Filices*).

From 5 to 15 Cm. long, 10 to 25 Mm. in thickness, and, together with the closely imbricated, dark brown, roundish, and slightly curved stipe-remnants, 50 to 75 Mm. in diameter; densely covered with brown, glossy, transparent, and soft, chaffy scales; internally pale green, rather spongy; vascular bundles about ten (*Dryopteris Filix-mas*) or six (*Dryopteris marginalis*) in number, arranged in an interrupted circle; odor slight, but disagreeable; taste sweetish, acrid, somewhat bitter, astringent, and nauseous.

The chaff, together with the dead portions of the rhizome and stipes, should be removed, and only such portions as have retained their green color should be used.

Preparation: Oleoresina Aspidii.

ASPIDOSPERMA.

ASPIDOSPERMA.

[QUEBRACHO.]

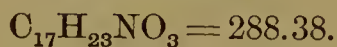
The bark of *Aspidosperma Quebracho-blanco* Schlechtendal (nat. ord. *Apocynaceæ*).

In nearly flat pieces, about 1 to 3 Cm. thick ; the outer surface yellowish-gray or brownish, deeply fissured ; inner surface yellowish-brown or reddish-brown, distinctly striate ; fracture displaying two sharply defined strata, of about equal thickness, and both marked with numerous whitish dots and striæ arranged in tangential lines ; the fracture of the outer, lighter colored layer rather coarsely granular, and that of the darker colored, inner layer short-splintery ; inodorous ; taste very bitter and slightly aromatic.

Preparation : Extractum Aspidospermatis Fluidum.

ATROPINA.

ATROPINE.



An alkaloid obtained from Belladonna. As it occurs in commerce, it is always accompanied by a small proportion of hyoscyamine extracted along with it, from which it cannot be readily separated.

White, acicular crystals, or a more or less amorphous, white powder, without odor, having a bitter, acrid taste, and gradually assuming a yellowish tint on exposure to air.

Soluble, at 15° C. (59° F.), in 130 parts of water, 3 parts of alcohol, 16 parts of ether, 4 parts of chloroform, and about 50 parts of glycerin.

At about 108° C. (226.4° F.) it melts, forming a colorless liquid ; at about 140° C. (284° F.) it begins to give off white, acrid fumes, and, when ignited, it is consumed without leaving a residue.

It has a markedly alkaline reaction ; its saturated aqueous solution acquires a pink color upon the addition of a drop of phenolphthalein T.S.

If a small quantity of atropine, or of one of its salts, be heated with a few Cc. of concentrated sulphuric acid, a peculiar odor, recalling that of a mixture of rose, orange-flower, and melilot, will become noticeable. On now gradually adding minute fragments of potassium dichromate, the odor will change to that of oil of bitter almond, the rose odor disappearing as more dichromate is added.

Atropine and its salts are decomposed by prolonged contact with sodium or potassium hydrate, and if heated with either of them, evolve ammonia.

On dissolving a small quantity (about 0.1 Gm.) of atropine in 2 Cc. of alcohol, and adding an equal volume of mercuric chloride T.S., a yellow precipitate, which soon turns red, is produced.

On adding concentrated sulphuric acid to atropine, no color should be produced (absence of *readily carbonizable, organic impurities*), nor should any color be developed by the subsequent addition of nitric acid (absence of and difference from *morphine*).

The aqueous solution of atropine, or of any of its salts, is not precipitated by platinic chloride T.S. (difference from *most other alkaloids*).

With gold chloride T.S. it gives a precipitate which, when recrystallized from boiling water acidulated with hydrochloric acid, is deposited, on cooling, in minute crystals forming a yellow, lustreless powder on drying (difference from, and absence of more than a small proportion of, *hyoscyamine*).

ATROPINÆ SULPHAS.

ATROPINE SULPHATE.



A white, indistinctly crystalline powder, without odor, having a very bitter, nauseating taste, and permanent in the air.

Soluble, at 15° C. (59° F.), in 0.4 part of water, 6.2 parts of alcohol, 2270 parts of ether, or 694 parts of chloroform.

At 187° C. (309° F.) the salt melts, forming a brownish-yellow liquid. When ignited, it chars, emits acid vapors, and is completely consumed.

The salt is neutral to litmus paper.

On adding sodium carbonate T.S. to a concentrated aqueous solution of the salt, a white precipitate is obtained which should respond to the reactions and tests given under Atropine (see *Atropina*).

The aqueous solution of the salt yields, with barium chloride T.S., a white precipitate insoluble in hydrochloric acid.

AURANTII AMARI CORTEX.

BITTER ORANGE PEEL.

The rind of the fruit of *Citrus vulgaris* Risso (nat. ord. *Rutaceæ*).

In narrow, thin bands, or in quarters; epidermis of a dark brownish-green color, glandular, and with very little of the spongy, white, inner layer adhering to it; it has a fragrant odor, and an aromatic, bitter taste.

Preparations: Extractum Aurantii Amari Fluidum. Tinctura Aurantii Amari.

AURANTII DULCIS CORTEX.

SWEET ORANGE PEEL.

The rind of the fresh fruit of *Citrus Aurantium* Linné (nat. ord. *Rutaceæ*).

Closely resembling Bitter Orange Peel, but having an orange-yellow color. It has a sweetish, fragrant odor, and an aromatic, slightly bitter taste.

Preparations: Syrupus Aurantii. Tinctura Aurantii Dulcis.

AURI ET SODII CHLORIDUM.

GOLD AND SODIUM CHLORIDE.

A mixture of equal parts, by weight, of dry Gold Chloride [$\text{AuCl}_3 = 2.81$] and Sodium Chloride [$\text{NaCl} = 58.37$].

It should be kept in well-stoppered vials.

An orange-yellow powder, odorless, having a saline and metallic taste, and slightly deliquescent in damp air.

The compound is very soluble in water, and at least one-half of it should be soluble in cold alcohol.

When exposed to a red heat, it is decomposed, and metallic gold is separated.

A fragment of the compound imparts a persistent, intensely-yellow color to a non-luminous flame.

Its aqueous solution has a slightly acid reaction, and yields, with silver nitrate T.S., a white precipitate insoluble in nitric acid.

On bringing a glass rod, dipped into ammonia water, close to a portion of the compound, no white fumes should make their appearance (absence of *free acid*).

If 0.5 Gm. of Gold and Sodium Chloride be dissolved in 50 Cc. of water, in a porcelain capsule, the solution acidulated with 5 Cc. of diluted sulphuric acid, and, after the addition of 1 Gm. of pure oxalic acid, heated for about two hours, on a water-bath, a precipitate of metallic gold will be obtained, which, when washed, dried, and ignited, should weigh not less than 0.15 Gm. (corresponding to at least 30 per cent. of metallic gold).

The filtrate from the precipitated gold should not be affected by hydrogen sulphide T.S., nor, after being supersaturated with ammonia water, by ammonium sulphide T.S. (absence of *metallic impurities*).

BALSAMUM PERUVIANUM.

BALSAM OF PERU.

A balsam obtained from *Toluiifera Pereiræ* (Royle) Baillon (nat. ord. *Leguminosæ*).

A liquid having a syrupy consistence, free from stringiness or stickiness, of a brownish-black color in bulk, reddish-brown and transparent in thin layers, of an agreeable vanilla-like, somewhat smoky odor, and a bitter taste, leaving a persistent after-taste. On exposure to air it does not become hard.

Specific gravity: 1.135 to 1.150 at 15° C. (59° F.).

Miscible, in all proportions, with absolute alcohol, chloroform, or glacial acetic acid; only partially soluble in ether or benzin. It is completely soluble in 5 parts of alcohol.

Water agitated with a portion of the Balsam reddens blue litmus paper.

If 1 Cc. of carbon disulphide be mixed with 3 Cc. of the Balsam, contained in a dry test-tube, a clear liquid will result. On now adding 8 more Cc. of carbon disulphide and agitating, the resinous constituent of the Balsam (amounting to about 15 per cent.) will adhere to the walls of the tube, and the liquid portion will be clear, of a tint not deeper than light brownish, and not more than faintly fluorescent (absence of *gurjun balsam*).

If 2 Cc. of the Balsam be vigorously shaken, in a dry test-tube, with 8 Cc. of benzin, so that the Balsam may be spread over the walls of the tube, and the liquid then immediately poured off, the Balsam should remain adherent to the walls for some minutes and subside slowly, while the liquid (which should be filtered, if turbid) should be colorless or only faintly yellow, and should deposit no sediment on standing (absence of appreciable quantities of *storax*, *turpentine*, *copaiba*, etc.).

If 10 drops of the Balsam be triturated, in a small mortar, with 20 drops of sulphuric acid, a tough, homogeneous, brownish-red mass will result, which, when washed with cold water, should, after a few minutes, be converted into a brittle, resinous mass (absence of *fixed oils*).

On distilling water with a portion of the Balsam, no *essential oil* should pass over.

BALSAMUM TOLUTANUM.

BALSAM OF TOLU.

A balsam obtained from *Toluiifera Balsamum* Linné (nat. ord. *Leguminosæ*).

A yellowish-brown, semifluid or nearly solid mass, becoming more brittle when exposed to cold, transparent in thin layers, having an agreeable odor recalling that of vanilla, but distinct from it, and a mild, aromatic taste.

Readily and completely soluble in alcohol, the solution showing an acid reaction with litmus paper. Also completely soluble in chloroform, and in solutions of the fixed alkalies; almost completely soluble in ether, but nearly insoluble in water, benzin, or carbon disulphide.

Carbon disulphide, aided by a gentle heat, removes from the Balsam scarcely anything but some of its cinnamic and benzoic acids. On decanting and evaporating the disulphide, no substance having the properties of *resin* should remain.

Preparations: Syrupus Tolutanus. Tinctura Benzoini Composita. Tinctura Tolutana.

BARI DIOXIDUM.**BARII DIOXIDE.**

[BARIUM PEROXIDE.]

(Commercial, anhydrous Barium Dioxide.

It should be kept in well-closed vessels.

A heavy, grayish-white, or pale yellowish-white, amorphous, coarse powder, odorless and tasteless. When exposed to the air, it slowly attracts moisture and carbon dioxide, and is gradually decomposed.

Almost insoluble in cold water, with which, however, it forms a definite hydrate, and to which it imparts a decidedly alkaline reaction. Hydrochloric, phosphoric, and most other mineral acids decompose it, producing the corresponding barium salts, and hydrogen dioxide, which remains in solution for a considerable time, if the reaction has taken place in the cold, and an excess of the acid is present.

When heated to a bright red heat, Barium Dioxide fuses, loses oxygen, and is reduced to barium oxide.

Barium Dioxide should be dissolved by diluted hydrochloric or phosphoric acid without leaving more than a trace of residue.

If 2.11 Gm. of Barium Dioxide be dissolved, as completely as possible, in ice-cold water to the volume of 25 Cc., with the aid of 7.5 Cc. of phosphoric acid, and 5 Cc. of this solution (corresponding to 0.422 Gm. of the Dioxide) be measured off for assay, it should require not less than 40 Cc. of decinormal potassium permanganate V.S. to impart to the liquid a permanent pink tint, corresponding to not less than 80 per cent. of pure Barium Dioxide (each Cc. of the volumetric solution indicating 2 per cent. of the latter).

Preparation: Aqua Hydrogenii Dioxidii.

BELLADONNÆ FOLIA.**BELLADONNA LEAVES.**

The leaves of *Atropa Belladonna* Linné (nat. ord. *Solanaceæ*).

Leaves from 10 to 15 Cm. long, from 5 to 10 Cm. broad, broadly ovate, equilaterally narrowed into a petiole, tapering at the apex, entire on the margin, smooth, thin, the upper surface brownish-green, the lower surface grayish-green, both surfaces whitish punctate; odor slight; taste bitterish, disagreeable.

Preparations: Extractum Belladonnæ Foliorum Alcoholicum. Tinctura Belladonnæ Foliorum.

BELLADONNÆ RADIX.**BELLADONNA ROOT.**

The root of *Atropa Belladonna* Linné (nat. ord. *Solanaceæ*).

In cylindrical, somewhat tapering, longitudinally wrinkled pieces, 10 to 25 Mm. or more in thickness; externally brownish-gray, internally whitish; fracture nearly smooth and mealy, not radiating or showing medullary rays in the thicker roots, only in the layer near the bark; nearly inodorous; taste sweetish, afterwards bitterish and strongly acrid.

Roots which are tough and woody, breaking with a splintery fracture, should be rejected; likewise the hollow stem-bases which are sometimes present.

Preparation: Extractum Belladonnæ Radicis Fluidum.

BENZINUM.

BENZIN.

[PETROLEUM BENZIN. PETROLEUM ETHER.]

A purified distillate from American petroleum, consisting of hydrocarbons, chiefly of the marsh-gas series [C_5H_{12} , C_6H_{14} , and homologous compounds].

Benzin should be carefully kept in well-stoppered bottles or tin cans, in a cool place, remote from lights or fire.

A transparent, colorless, diffusive liquid, of a strong, characteristic odor, slightly resembling that of petroleum, but much less disagreeable, and having a neutral reaction.

Specific gravity: 0.670 to 0.675 at 15° C. (59° F.).

Boiling point: 50° to 60° C. (122° to 140° F.).

Insoluble in water; soluble in about 6 parts of alcohol, and readily soluble in ether, chloroform, benzol, and fixed and volatile oils.

Benzin is highly inflammable, and its vapor, when mixed with air and ignited, explodes violently.

On evaporating Benzin from the hand, it should leave no odor, and on evaporating it from a warmed dish, it should leave no residue (absence of *heavy hydrocarbons*).

When it is boiled for a few minutes with one-fourth its volume of spirit of ammonia, and a few drops of silver nitrate T.S., the ammoniacal liquid should not turn brown (absence of *pyrogenous products* and *sulphur compounds*).

If 5 drops of Benzin be added to a mixture of 40 drops of sulphuric and 10 drops of nitric acid, in a test-tube, the liquid warmed for about ten minutes, and then set aside for half an hour, on diluting it, in a shallow dish, with water, it should not evolve the bitter-almond-like odor of nitro-benzol (difference from, and absence of, *benzol*).

BENZOINUM.

BENZOIN.

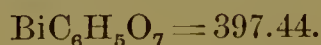
A balsamic resin obtained from *Styrax Benzoin* Dryander (nat. ord. *Styracæ*).

In lumps consisting of agglutinated, yellowish-brown tears, which are internally milk-white, or in the form of a reddish-brown mass, more or less mottled from whitish tears imbedded in it. It is almost wholly soluble in 5 parts of moderately warm alcohol, and in solutions of the fixed alkalies. When heated, it gives off fumes of benzoic acid. It has an agreeable, balsamic odor, and a slight, aromatic taste.

Preparations: Adeps Benzoinatus. Tinctura Benzoini. Tinctura Benzoini Composita.

BISMUTHI CITRAS.

BISMUTH CITRATE.



Bismuth Subnitrate, one hundred grammes 100 Gm.

Citric Acid, seventy grammes 70 Gm.

Distilled Water, a sufficient quantity.

Boil the Bismuth Subnitrate and the Citric Acid with *four hundred* (400) *cubic centimeters* of Distilled Water for about fifteen minutes, or until a drop of the mixture yields a clear solution with ammonia water. Then add *five thousand* (5000) *cubic centimeters* of Distilled Water, allow the suspended matter to deposit, wash the precipitate, first by decantation, and afterwards on a strainer, with Distilled Water, until the washings are tasteless, and dry the residue at a gentle heat.

A white, amorphous or micro-crystalline powder, odorless and tasteless, and permanent in the air.

Insoluble in water or alcohol, but soluble in ammonia water, and in solutions of the citrates of the alkalis.

When strongly heated, the salt chars, and, on ignition, leaves a more or less blackened residue having a yellow surface, and soluble in warm nitric acid. This solution, when dropped into water, occasions a white turbidity.

A solution of the salt in ammonia water, when treated with hydrogen sulphide in excess, yields a black precipitate.

If the filtrate from the latter be deprived by heat of the excess of hydrogen sulphide and cooled, a portion of it, boiled with lime water, yields a white precipitate.

If another portion of the cooled filtrate be mixed with an equal volume of concentrated sulphuric acid, and again cooled, no brown or brownish-black color should appear around a crystal of ferrous sulphate dropped into the liquid (limit of *nitrate*).

Preparation: Bismuthi et Ammonii Citras.

BISMUTHI ET AMMONII CITRAS.

BISMUTH AND AMMONIUM CITRATE.

Bismuth Citrate, *one hundred grammes*..... 100 Gm.

Ammonia Water,

Distilled Water, each, *a sufficient quantity*.

Mix the Bismuth Citrate with *two hundred* (200) *cubic centimeters* of Distilled Water to a smooth paste, heat the mixture on a water-bath, and gradually add Ammonia Water, until the salt is dissolved, and the liquid is neutral or has only a faintly alkaline reaction. Then filter the solution, evaporate it on a water-bath to a syrupy consistence, and spread it upon plates of glass, so that, when dry, the salt may be obtained in scales.

Keep the product in small, well-stoppered bottles, protected from light.

Small, shining, pearly or translucent scales, odorless, having a slightly acidulous and metallic taste, and becoming opaque on exposure to the air.

Very soluble in water, and but sparingly soluble in alcohol.

When strongly heated, the salt fuses, and finally leaves a more or less blackened residue, having a yellow surface, and soluble in warm nitric acid. This solution, when dropped into water, occasions a white turbidity.

The aqueous solution of the salt is neutral or faintly alkaline to litmus paper.

When boiled with potassium or sodium hydrate T.S., it evolves the vapor of ammonia, and when treated with hydrogen sulphide, it yields a black precipitate.

If the filtrate from the latter be deprived by heat of the excess of hydrogen sulphide and cooled, a portion of it, boiled with lime water, yields a white precipitate.

If another portion of the cooled filtrate be mixed with an equal volume of concentrated sulphuric acid, and again cooled, no brown or brownish-black color should appear around a crystal of ferrous sulphate dropped into the liquid (absence of *nitrate*).

BISMUTHI SUBCARBONAS.

BISMUTH SUBCARBONATE.

A white or pale yellowish-white powder, of somewhat varying chemical composition, odorless and tasteless, and permanent in the air.

Insoluble in water or alcohol, but completely soluble in nitric or hydrochloric acid, with copious effervescence.

When heated to redness, the salt loses water and carbon dioxide, and leaves from 87 to 91 per cent. of a yellow residue which is soluble in nitric or hydrochloric acid, and blackened by hydrogen sulphide.

If 3 Gm. of the salt be dissolved in just a sufficient quantity (about 4 Cc.) of warm nitric acid, and the solution poured into 100 Cc. of water, a white precipitate is produced. After filtering, and evaporating the filtrate on a water-bath to 30 Cc., again filtering, and dividing this filtrate into portions of 5 Cc., these should respond to the following tests:

On mixing one portion with an equal volume of diluted sulphuric acid, it should not become cloudy (absence of *lead*).

If another portion be precipitated with a slight excess of ammonia water, the supernatant liquid should not exhibit a bluish tint (absence of *copper*).

Other portions should not be affected by silver nitrate T.S. (absence of *chloride*), or barium nitrate T.S. (*sulphate*), nor yield, with hydrochloric acid, a precipitate which is insoluble in a slight excess of the latter (*silver*).

If 1 Gm. of the salt be boiled with 10 Cc. of a mixture of equal parts of acetic acid and water, the solution cooled and filtered, and the filtrate freed from bismuth by hydrogen sulphide and again filtered, the last filtrate should leave no residue on evaporation (absence of *alkalies* and *alkaline earths*).

On boiling 1 Gm. of the salt with 10 Cc. of potassium or sodium hydrate T.S., it should not evolve the odor of *ammonia*.

If 1 Gm. of the salt be added to 10 Cc. of a mixture of equal parts of concentrated sulphuric acid and water, tinged slightly blue with indigo T.S., on heating, the bluish tint should not be discharged (absence of *nitrate*).

If 1 Gm. of the salt be ignited in a porcelain crucible, the residue, when cold, dissolved in 5 Cc. of stannous chloride T.S. (see List of Reagents, Bettendorff's Test for Arsenic), and a small piece of pure tin-foil added, no dark coloration or precipitate should be produced within fifteen minutes (limit of *arsenic*).

BISMUTHI SUBNITRAS.

BISMUTH SUBNITRATE.

A heavy, white powder, of somewhat varying chemical composition, odorless and almost tasteless, and permanent in the air.

Almost insoluble in water, and insoluble in alcohol; but readily soluble in nitric or hydrochloric acid.

When heated to 120° C. (248° F.), the salt loses water (between 3 and 5 per cent. of its weight); and when subsequently heated to redness, it evolves nitrous vapors, leaving from 79 to 82 per cent. of its weight of a yellow residue which is soluble in nitric or hydrochloric acid, and blackened by hydrogen sulphide.

When brought upon moistened blue litmus paper, the salt shows a slightly acid reaction.

On dissolving 3 Gm. of the salt in 3 Cc. of warm nitric acid, no effervescence should occur (absence of *carbonate*), and no residue should be left (absence of *insoluble foreign salts*).

If this solution be poured into 100 Cc. of water, a white precipitate is produced.

If the filtrate separated from this precipitate be evaporated on a water-bath to 30 Cc., the liquid again filtered, and the new filtrate divided into portions of 5 Cc. each, these should respond to the tests for purity described under *Bismuthi Subcarbonas*.

When further tested as described under *Bismuthi Subcarbonas*, the salt should be found free from *alkalies* and *alkaline earths*, and should give no reaction for *ammonia*.

If 1 Gm. of the salt be heated, in a porcelain crucible, until nitrous vapors cease to be evolved, the residue, when cold, dissolved in 5 Cc. of stannous chloride T.S. (see List of Reagents, Bettendorff's Test for Arsenic), and a small piece of pure tin-foil added, no dark coloration or precipitate should be produced within fifteen minutes (limit of *arsenic*).

BROMUM.

BROMINE.

Br = 79.76.

Bromine should be kept in glass-stoppered bottles, in a cool place.

A heavy, dark brownish-red, mobile liquid, evolving, even at ordinary temperatures, a yellowish-red vapor, highly irritating to the eyes and lungs, and having a peculiar suffocating odor, resembling that of chlorine.

Specific gravity : 2.990 at 15° C. (59° F.).

Soluble in 30 parts of water at 15° C. (59° F.), and readily soluble in alcohol or ether (with gradual decomposition of these liquids); also in carbon disulphide, and in chloroform, with a deep reddish-yellow color.

On exposure to air or to heat, it is completely volatilized.

It destroys the color of solutions of litmus and indigo, and imparts a yellow color to solution of starch.

If Bromine be added to an excess of potassium or sodium hydrate T.S., it should combine to form a permanently clear liquid, without the separation of oily drops, or the development of an odor resembling that of chloroform (absence of *bromoform* or *other organic bromine compounds*).

If an aqueous solution of Bromine be shaken with a slight excess of reduced iron until it becomes nearly colorless, the filtered liquid, on the addition of a small amount of ferric chloride and of starch T.S., should not assume a blue color (absence of *iodine*).

If 1 Cc. of a saturated aqueous solution of Bromine be diluted with 9 Cc. of water, then mixed with 3 Cc. of ammonium carbonate T.S., and 5 Cc. of decinormal silver nitrate V.S., and the whole actively shaken, the filtered liquid, when supersaturated with nitric acid, should not become more than opalescent, nor separate a flocculent precipitate within three minutes (absence of more than 3 per cent. of *chlorine*).

BRYONIA.

BRYONIA.

[BRYONY.]

The root of *Bryonia alba*, and of *Bryonia dioica* Linné (nat. ord. *Cucurbitacea*).

In transverse sections about 5 Cm. in diameter, the bark gray-brown, rough, thin, the central portion whitish or grayish, with numerous, small, projecting wood-bundles arranged in circles and radiating lines; fracture short; inodorous; taste disagreeably bitter.

Preparation: Tinctura Bryoniæ.

BUCHU.

BUCHU.

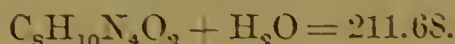
The leaves of *Barosma betulina* (Thunberg) Bartling et Wendland, and *Barosma crenulata* (Linné) Hooker (nat. ord. *Rutacea*).

About 15 Mm. long, roundish-obovate with a rather wedge-shaped base, or varying between oval and obovate, obtuse, crenate or serrate, with a gland at the base of each tooth, dull yellowish-green, thickish, pellucid-punctate; odor and taste strongly aromatic, somewhat mint-like, pungent and bitterish.

Preparation: Extractum Buchu Fluidum.

CAFFEINA.

CAFFEINE.



[THEINE.]

A feebly basic, proximate principle, obtained from the dried leaves of *Thea sinensis* Linné (nat. ord. *Ternstramiacea*), or from the dried seeds of *Coffea arabica* Linné (nat. ord. *Rubiacea*), and found also in other plants.

Fleecy masses of long, flexible, white crystals, possessing a silky lustre, without odor, having a bitter taste, and permanent in the air.

Soluble, at 15° C. (59° F.), in 80 parts of water, 33 parts of alcohol, 555 parts of ether, or 7 parts of chloroform. Also soluble in about 2 parts of boiling water, and very soluble in boiling alcohol.

When heated to 100° C. (212° F.), Caffeine loses its water of crystallization, and at 229° C. (444.2° F.) it melts, forming a colorless liquid. When ignited, Caffeine is completely volatilized without charring or leaving a residue.

Caffeine is neutral to litmus paper.

On dissolving a small quantity of Caffeine in concentrated sulphuric acid, and adding a minute fragment of potassium dichromate to the liquid, the latter will acquire a yellowish-green color, which gradually becomes green.

If a small quantity of Caffeine be dissolved in about 1 Cc. of hydrochloric acid, a little potassium chlorate added, the whole evaporated to dryness on a water-bath, and the capsule then inverted over a vessel containing a few drops of ammonia water, the residue will acquire a rich purple color, which is destroyed by alkalis.

Caffeine should dissolve in strong sulphuric or nitric acid without producing a color (absence of *organic impurities*).

Its aqueous solution should not be precipitated by mercuric potassium iodide T.S. (absence of *other alkaloids*).

Preparations: Caffeina Citrata. Caffeina Citrata Effervescens.

CAFFEINA CITRATA.

CITRATED CAFFEINE.

Caffeine, <i>fifty grammes</i>	50 Gm.
Citric Acid, <i>fifty grammes</i>	50 Gm.
Distilled Water, hot, <i>one hundred cubic centimeters</i>	100 Cc.

Dissolve the Citric Acid in the hot Distilled Water, add the Caffeine, and evaporate the resulting solution, on a water-bath, to dryness, constantly stirring towards the end of the operation. Reduce the product to a fine powder and transfer it to well-closed bottles.

A white powder, odorless, having a purely acid taste and an acid reaction.

One part of Citrated Caffeine forms a clear, syrupy solution with about 3 parts of water. Upon dilution with water, this yields a white precipitate (caffeine), which redissolves when about 25 parts of water have been added. It is also soluble in a mixture of 2 volumes of chloroform and 1 volume of alcohol.

CAFFEINA CITRATA EFFERVESCENS.

EFFERVESCENT CITRATED CAFFEINE.

Caffeine, <i>ten grammes</i>	10 Gm.
Citric Acid, <i>ten grammes</i>	10 Gm.
Sodium Bicarbonate, <i>three hundred and thirty grammes</i> ..	330 Gm.
Tartaric Acid, <i>three hundred grammes</i>	300 Gm.
Sugar, in very fine powder, <i>three hundred and fifty grammes</i>	350 Gm.
Alcohol, <i>a sufficient quantity</i> .	

To make *one thousand grammes*.... 1000 Gm.

Triturate the solid ingredients, separately well dried, to a fine, uniform powder. Mix this with Alcohol to a soft paste and rub it through No. 6 tinned-iron sieve or enamelled colander. Then dry it, and reduce it to a coarse, granular powder. Keep the product in well-topped bottles.

CALAMUS.

CALAMUS.

[SWEET FLAG.]

The rhizome of *Acorus Calamus* Linné (nat. ord. *Aroideæ*).

In sections of various lengths, unpeeled, about 2 Cm. broad, subcylindrical, longitudinally wrinkled; on the upper surface marked with leaf-scars forming triangles, and on the lower surface with the circular scars of the rootlets in wavy lines; externally reddish-brown, somewhat annulate from remnants of leaf-sheaths; internally whitish, of a spongy texture, breaking with a short, corky fracture, showing numerous oil-cells and scattered wood-bundles, the latter crowded within the subcircular endoderm. It has an aromatic odor, and a strongly bitter taste.

Preparation: Extractum Calami Fluidum.

CALCII BROMIDUM.

CALCIUM BROMIDE.

$\text{CaBr}_2 = 199.43.$

Calcium Bromide should be kept in well-stoppered bottles.

A white, granular salt, odorless, of a sharp saline taste, and very deliquescent.

Soluble, at 15° C. (59° F.), in 0.7 part of water, and in 1 part of alcohol; much more soluble at a boiling temperature.

At 680° C. (1256° F.) the salt fuses, and at a higher temperature it is partly decomposed, with loss of bromine.

The salt is neutral to litmus paper.

The aqueous solution (1 in 20) of the salt yields, with ammonium oxalate T.S., a white precipitate insoluble in acetic acid, but soluble in hydrochloric acid.

If to 5 Cc. of the aqueous solution a few drops of chloroform be added and then 1 Cc. of chlorine water, bromine will be liberated, and, on agitating the mixture, will dissolve in the chloroform with a yellow or brownish-yellow color.

If 1 Gm. of the salt be dissolved in 20 Cc. of water, it should form a clear, colorless solution, leaving no residue (absence of *insoluble impurities*).

If to 5 Cc. of this aqueous solution, slightly acidulated with hydrochloric acid, an equal volume of hydrogen sulphide T.S. be added, neither coloration nor turbidity should be perceptible (absence of *arsenic, lead, etc.*).

The addition of ammonium sulphide T.S. to the aqueous solution should not produce any color or turbidity (absence of *iron, aluminum, etc.*).

If 5 Cc. of the aqueous solution (1 in 20), slightly acidulated with acetic acid, be completely precipitated with ammonium oxalate T.S., the filtrate should, on evaporation, leave not more than a trace of fixed residue (limit of *magnesium and alkalies*).

If diluted sulphuric acid be dropped upon the salt, the latter should not at once assume a yellow color (absence of *bromate*).

If to 5 Cc. of the aqueous solution (1 in 20) a few drops of starch T.S. be added, and then chlorine water, drop by drop, no blue color should appear (absence of *iodide*).

No turbidity should be produced, if 0.2 Cc. of barium chloride T.S. be added to 5 Cc. of the aqueous solution (absence of *sulphate*).

If 1 Gm. of the salt be mixed with 0.5 Gm. of iron filings and 0.5 Gm. of powdered zinc, and heated in a test-tube with 5 Cc. of sodium hydrate T.S., no ammoniacal vapors should be evolved (absence of *nitrate* or *nitrite*).

If 0.25 Gm. of the well-dried salt be dissolved in 10 Cc. of water and 2 drops of potassium chromate T.S. added, it should require 25 Cc. of decinormal silver nitrate V.S. to produce a permanent red color (corresponding to 99.7 per cent. of the pure salt, a greater amount indicating presence of *chloride*, a smaller amount *other impurities*).

CALCII CARBONAS PRÆCIPITATUS.

PRECIPITATED CALCIUM CARBONATE.



A fine, white powder, without odor or taste, and permanent in the air.

Nearly insoluble in water; the solubility is increased by the presence of ammonium salts, and especially by carbonic acid; alkali hydrates diminish it. Insoluble in alcohol. In diluted acetic, hydrochloric, or nitric acid, it is completely soluble, with effervescence.

When heated to redness with access of air, the salt loses carbon dioxide, and a residue of calcium oxide remains.

For applying tests of identity and of purity, boil 6 Gm. of Calcium Carbonate with a mixture of 50 Cc. of diluted acetic acid and 50 Cc. of water, allow the liquid to cool, and filter.

In this solution, ammonium oxalate T.S. produces a white precipitate insoluble in acetic acid, but soluble in hydrochloric acid.

If from 20 Cc. of this solution the calcium be completely precipitated by a slight excess of ammonium oxalate T.S., the filtrate should, on evaporation, leave only a trace of fixed residue (limit of *magnesium* and *alkalies*).

If 10 Cc. of the solution be slightly acidulated with acetic acid, no immediate turbidity should be produced by the addition of 0.5 Cc. of barium chloride T.S. (limit of *sulphate*).

If to 10 Cc. of the solution, slightly acidulated with nitric acid, 0.1 Cc. of silver nitrate V.S. be added, and the precipitate, if any, removed by filtration, the filtrate should remain perfectly clear upon addition of more silver nitrate V.S. (limit of *chloride*).

Addition of ammonia water should not produce any turbidity in the solution (absence of *iron*, *aluminum*, *phosphate*, etc.).

If to the solution, slightly acidulated with acetic acid, an equal volume of hydrogen sulphide T.S. be added, neither color nor turbidity should be produced (absence of *arsenic*, *lead*, etc.).

If 1 Gm. of the salt be agitated with 50 Cc. of water, the filtrate should not show an alkaline reaction with litmus paper, and, on evaporation, should not leave more than a trace of residue (limit of *soluble impurities*).

CALCII CHLORIDUM.

CALCIUM CHLORIDE.



Calcium Chloride, rendered anhydrous by fusion at the lowest possible temperature.

It should be kept in well-stoppered bottles.

White, slightly translucent, hard fragments, odorless, having a sharp, saline taste, and very deliquescent.

Soluble, at 15° C. (59° F.), in 1.5 parts of water, and in 8 parts of alcohol; in 1.5 parts of boiling alcohol, and very freely in boiling water; insoluble in ether.

Below a red heat the salt fuses, and, on cooling, solidifies without change in composition; but at a higher temperature, especially if kept in fusion for some time, a portion is decomposed and calcium oxide formed.

When perfectly pure, the salt dissolves in water without residue, and the solution is strictly neutral to litmus paper.

When the salt is overheated in fusing, the solution has an alkaline reaction, and a small residue is left, which is soluble in hydrochloric acid.

The aqueous solution (1 in 20) yields, with ammonium oxalate T.S., a white precipitate insoluble in acetic acid, but soluble in hydrochloric acid.

With silver nitrate T.S. it yields a white precipitate insoluble in nitric acid.

The aqueous solution (1 in 20) should remain clear upon addition of ammonia water (absence of *iron*, *aluminum*, etc.), or of barium chloride T.S. (absence of *sulphate*).

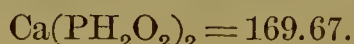
If from 20 Cc. of the solution the calcium be completely precipitated by ammonium oxalate T.S., the filtrate should, on evaporation, leave not more than a trace of fixed residue (limit of *magnesium* and *alkalies*).

If 5 Cc. of the aqueous solution, acidulated with hydrochloric acid, be mixed with an equal volume of hydrogen sulphide T.S., neither color nor turbidity should appear (absence of *arsenic*, *lead*, etc.).

No turbidity should be produced by the addition of 0.5 Cc. of potassium dichromate T.S. to 5 Cc. of the aqueous solution (absence of *barium*).

CALCII HYPOPHOSPHIS.

CALCIUM HYPOPHOSPHITE.



Colorless, transparent, monoclinic prisms, or small, lustrous scales, or a white, crystalline powder, odorless, having a nauseous, bitter taste, and permanent in the air.

Soluble, at 15° C. (59° F.), in 6.8 parts of water, and in 6 parts of boiling water; insoluble in alcohol.

When heated in a test-tube, the salt decrepitates, and above 300° C. (572° F.) it begins to decompose, giving off water, and emitting inflammable gases (hydrogen and hydrogen phosphide), and leaving a residue of calcium pyrophosphate and metaphosphate, with some red phosphorus.

The aqueous solution (1 in 20) is neutral to litmus paper, and yields, with ammonium oxalate T.S., a white precipitate insoluble in acetic acid, but soluble in hydrochloric acid.

The aqueous solution, slightly acidulated with sulphuric acid, yields, with silver nitrate T.S., a precipitate which is white at first, but rapidly turns brown and black by separation of metallic silver.

With copper sulphate T.S., on gentle heating, a reddish-brown precipitate of copper hydride is formed.

When the aqueous solution is added, drop by drop, to mercuric chloride T.S., at first a white precipitate of mercurous chloride is formed, which, as soon as the hypophosphite solution is added in excess, turns gray from reduction to metallic mercury.

If 1 Gm. of the salt be dissolved in 20 Cc. of water, no insoluble residue should be left (absence of *phosphate*, *sulphate*, and other *insoluble impurities*).

In this solution no precipitate should be produced by the addition of lead acetate T.S. (absence of *soluble phosphate*); nor, after acidulating with hydrochloric acid, by barium chloride T.S. (absence of *soluble sulphate*); nor by an equal volume of hydrogen sulphide T.S. (absence of *arsenic*, etc.).

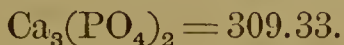
On adding to 5 Cc. of the solution (1 in 20) 1 Cc., each, of ammonium chloride T.S. and ammonia water, and 3 Cc. of ammonium carbonate T.S., applying a gentle heat for a few minutes, and then filtering, not more than a very slight turbidity should be produced upon adding to the filtrate a few drops of sodium phosphate T.S. (limit of *magnesium*).

If 0.1 Gm. of the salt be dissolved in 10 Cc. of water, then mixed with 10 Cc. of sulphuric acid and 50 Cc. of decinormal potassium permanganate V.S., and the mixture boiled for fifteen minutes, it should require not more than 3 Cc. of decinormal oxalic acid V.S. to discharge the red color (corresponding to at least 99.68 per cent. of the pure salt).

Preparation: Syrupus Hypophosphitum.

CALCII PHOSPHAS PRÆCIPITATUS.

PRECIPITATED CALCIUM PHOSPHATE.



A light, white, amorphous powder, odorless and tasteless, and permanent in the air.

Almost insoluble in cold water; partly decomposed by boiling water, which dissolves out an acid salt; almost insoluble in acetic acid, except when freshly precipitated; easily soluble in hydrochloric or nitric acid; insoluble in alcohol.

At an intense, white heat the salt fuses without decomposition.

When moistened with silver nitrate T.S., a yellow color is assumed by the salt either before or after ignition (distinction from *acid calcium phosphate*, which, after ignition, when moistened with silver nitrate, remains white).

For applying tests of identity and purity, shake 2 Gm. of the salt with 20 Cc. of water and add nitric acid, drop by drop, until solution is effected; then add water to make the liquid measure 40 Cc.

No effervescence should occur on adding the acid (absence of *carbonate*).

From a portion of this solution the salt is precipitated unchanged by a slight excess of ammonia water.

From another portion ammonium molybdate T.S. precipitates yellow ammonium phosphomolybdate; the reaction is accelerated by a gentle heat.

If to 5 Cc. of the solution, acidulated with nitric acid, 0.5 Cc. of silver nitrate T.S. be added, not more than a slight turbidity should result (limit of *chloride*).

The clear solution should not be rendered turbid by barium chloride T.S. (absence of *sulphate*); nor by potassium sulphate T.S. (*barium*); nor by an equal volume of hydrogen sulphide T.S. (*arsenic, lead, etc.*); nor should it be colored blue by potassium ferrocyanide T.S. (*iron*).

If 5 Cc. of the solution be mixed with 1 Cc. of sodium acetate T.S., and then with ammonium oxalate T.S., until the calcium is completely precipitated, the filtrate should not be rendered very turbid by adding ammonia water in slight excess (limit of *magnesium*).

CALCII SULPHAS EXSICCATUS.

DRIED CALCIUM SULPHATE.

[DRIED GYPSUM.]

A powder containing about 95 per cent., by weight, of Calcium Sulphate [$\text{CaSO}_4 = 135.73$], and about 5 per cent. of Water; prepared from the purer varieties of Native Gypsum [$\text{CaSO}_4 + 2\text{H}_2\text{O} = 171.65$], by carefully heating until about three-fourths of the water has been expelled.

Dried Calcium Sulphate should be kept in well-closed vessels, carefully protected from moisture.

A fine, white powder, without odor or taste.

From moist air it attracts water, becomes granular, and then loses the property of hardening with water.

When mixed with half of its weight of water, Dried Calcium Sulphate forms a smooth, cohesive paste, which rapidly hardens.

It is soluble in about 410 parts of water, at 15° C. (59° F.) ; in 388 parts, at 38° C. (100.4° F.) ; and in 476 parts, at 100° C. (212° F.). In alcohol it is insoluble. It readily dissolves in diluted nitric or hydrochloric acid, also in saturated solutions of potassium nitrate, sodium hyposulphite, and of various ammonium salts.

When heated above 204° C. (399.2° F.), Dried Calcium Sulphate becomes anhydrous and loses the property of forming a paste with water and hardening rapidly.

Its saturated solution in water should be neutral to litmus paper.

It forms white precipitates with barium chloride T.S., with ammonium oxalate T.S., and with alcohol.

No effervescence should occur on the addition of diluted acids to Dried Calcium Sulphate (absence of *carbonate*).

CALENDULA.

CALENDULA.

[MARIGOLD.]

The florets of *Calendula officinalis* Linné (nat. ord. *Compositæ*).

Florets about 12 Mm. long, linear and strap-shaped, delicately veined in a longitudinal direction, yellow or orange-colored, three-toothed above, the short hairy tube enclosing the remnants of a filiform style terminating in two elongated branches ; odor slight and somewhat heavy ; taste somewhat bitter and faintly saline.

Preparation : Tinctura Calendulæ.

CALUMBA.

CALUMBA.

[COLUMBO.]

The root of *Jateorhiza palmata* (Lamarek) Miers (nat. ord. *Menispermaceæ*).

In nearly circular disks, 3 to 6 Cm. in diameter, externally greenish-brown and wrinkled, internally yellowish or grayish-yellow, depressed in the center, with a few interrupted circles of projecting wood-bundles, distinctly radiate in the outer portion ; fracture short, mealy ; odor slight ; taste mucilaginous, slightly aromatic, very bitter.

Preparations : Extractum Calumbæ Fluidum. Tinctura Calumbæ.

CALX.

LIME.

CaO = 55.87.

Lime prepared by burning white marble, oyster-shells, or the purest varieties of natural calcium carbonate.

It should be kept in well-closed vessels, in a dry place.

Hard, white, or grayish-white masses, which, in contact with air, gradually attract moisture and carbon dioxide, and fall to a white powder; odorless; of a sharp, caustic taste.

Soluble in about 750 parts of water at 15° C. (59° F.), and in about 1300 parts of boiling water; insoluble in alcohol. Soluble in diluted acetic, hydrochloric, or nitric acid.

When sprinkled with about half its weight of water, lime becomes heated, and is gradually converted into a white powder (calcium hydrate or slaked lime). When this is mixed with about 3 or 4 parts of water, it forms a uniform smooth magma (milk of lime).

Even at the highest degrees of heat, lime remains unaltered and does not fuse.

Its aqueous solution gives an intensely alkaline reaction with litmus paper.

Its solution in diluted acetic acid gives, with ammonium oxalate T.S., a white precipitate insoluble in acetic acid, but soluble in hydrochloric acid.

If 1 part of Lime be slaked and then thoroughly mixed with 50 parts of water, and the greater portion of the milky liquid decanted, no hard, gritty particles should be found in the residue, nor should the addition of hydrochloric acid to this residue cause much effervescence (limit of *carbonate*), nor leave more than a slight, insoluble residue.

If the decanted portion be dissolved in acetic acid and filtered, if necessary, a portion of the filtrate should not be rendered turbid by potassium dichromate T.S. (absence of *barium*).

In another portion of the filtrate, the addition of ammonia water should not produce more than a slight turbidity (limit of *aluminum*, etc.).

Preparations: Liquor Calcis. Potassa cum Calce. Syrupus Calcis.

CALX CHLORATA.

CHLORINATED LIME.

A compound resulting from the action of chlorine upon calcium hydrate, and containing not less than 35 per cent. of available chlorine. This preparation is often improperly called "Chloride of Lime." Chlorinated Lime should be kept in well-closed vessels, in a cool and dry place.

A white, or grayish-white, granular powder, exhaling the odor of hypochlorous acid, having a repulsive, saline taste, and becoming moist and gradually decomposing on exposure to air.

In water or in alcohol it is only partially soluble.

The aqueous solution first colors red litmus paper blue, and then bleaches it.

If the salt be dissolved in diluted acetic acid, an abundance of chlorine gas is evolved, and only a trifling residue left undissolved.

From this solution ammonium oxalate T.S. throws down a white precipitate insoluble in acetic acid, but soluble in hydrochloric acid.

If 0.35 (0.354) Gm. of Chlorinated Lime be thoroughly triturated with 50 Cc. of water and carefully transferred, together with the washings, into a flask, and then 0.8 Gm. of potassium iodide and 5 Cc. of diluted hydrochloric acid added, the reddish-brown liquid, mixed, towards the end of the titration, with a few drops of starch T.S., should require, for complete decoloration, not less than 35 Cc. of decinormal sodium hyposulphite V.S. (each Cc. corresponding to 1 per cent. of available chlorine).

CALX SULPHURATA.

SULPHURATED LIME.

[CRUDE CALCIUM SULPHIDE.]

A mixture containing at least 60 per cent. of Calcium Monosulphide [$\text{CaS} = 71.89$], together with unchanged Calcium Sulphate [$\text{CaSO}_4 = 135.73$], and Carbon, in varying proportions.

Dried Calcium Sulphate, in fine powder, <i>seventy grammes</i>	70 Gm.
Charcoal, in fine powder, <i>ten grammes</i>	10 Gm.
Starch, <i>two grammes</i>	2 Gm.

Mix them thoroughly, pack the mixture lightly into a crucible, cover this loosely, and heat it to bright redness, until the contents have lost their black color. Allow the crucible to cool, reduce the product to powder, and at once transfer it to small, glass-stoppered vials.

A pale gray powder, exhaling a faint odor of hydrogen sulphide, having a nauseous, alkaline taste, and gradually decomposed by exposure to air.

Very slightly soluble in cold water, more readily in boiling water, which partially decomposes it; insoluble in alcohol.

Sulphurated Lime is decomposed by diluted acetic acid, and converted into calcium acetate and hydrogen sulphide gas which escapes, while a residue of calcium sulphate remains.

The filtrate from this yields, with ammonium oxalate T.S., a white precipitate insoluble in acetic acid, but soluble in hydrochloric acid.

If 1 Gm. of Sulphurated Lime be gradually added to a boiling solution of 2.08 Gm. of cupric sulphate in 50 Cc. of water, the mixture digested on a water-bath for fifteen minutes, and filtered when cold, no color should be imparted to the filtrate by 1 drop of potassium ferrocyanide T.S. (presence of at least 60 per cent. of pure Calcium Monosulphide).

CAMBOGIA.

GAMBUGE.

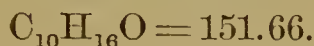
A gum-resin obtained from *Garcinia Hanburii* Hooker filius (nat. ord. *Guttiferæ*).

In cylindrical pieces, sometimes hollow in the center, 2 to 5 Cm. in diameter. longitudinally striate on the surface; fracture flattish-conchoidal, of a waxy lustre, orange-red; in powder bright yellow; inodorous; taste very acrid; the powder sternutatory.

Gamboge is partly soluble in alcohol and in ether. When triturated with water, it yields a yellow emulsion, and forms with solution of potassium or sodium hydrate an orange-red solution, from which, on the addition of hydrochloric acid, a yellow resin is precipitated.

Boiled with water, Gamboge yields a liquid which, after cooling, does not become green with iodine T.S. (absence of *starch*).

Preparation: *Pilulæ Catharticæ Compositæ*.

CAMPHORA.**CAMPHOR.**

A stearopten (having the nature of a ketone) obtained from *Cinnamum Camphora* (Linné) Nees et Ebermaier (nat. ord. *Laurineæ*), and purified by sublimation.

Camphor should be kept in well-closed vessels, in a cool place.

White, translucent masses, of a tough consistence and a crystalline structure, readily pulverizable in the presence of a little alcohol, ether, or chloroform; having a penetrating, characteristic odor, and a pungently aromatic taste.

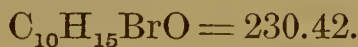
Specific gravity: 0.995 at 15° C. (59° F.).

Very sparingly soluble in water, but readily soluble in alcohol, ether, chloroform, carbon disulphide, benzin, and in fixed and volatile oils.

When Camphor is triturated, in about molecular proportions, with menthol, thymol, phenol, or chloral hydrate, liquefaction ensues. It melts at 175° C. (347° F.), boils at 204° C. (399.2° F.), and is inflammable, burning with a luminous, smoky flame.

On exposure to the air it evaporates more or less rapidly at ordinary temperatures, and, when moderately heated, it sublimes without leaving a residue.

Preparations: Aqua Camphoræ. Linimentum Camphoræ. Linimentum Saponis. Spiritus Camphoræ. Tinctura Opii Camphorata.

CAMPHORA MONOBROMATA.**MONOBROMATED CAMPHOR.**

Colorless, prismatic needles or scales, having a mild, camphoraceous odor and taste, permanent in the air, unaffected by light, and neutral to litmus paper.

Almost insoluble in water; freely soluble in alcohol, ether, chloroform, hot benzin, and fixed and volatile oils; slightly soluble in glycerin. It is also soluble, without decomposition, in cold, concentrated sulphuric acid, from which it separates again unaltered, when the solution is poured into water.

It melts at 76° C. (168.8° F.), and sublimes at a slightly higher temperature. At 274° C. (525.2° F.) it boils without decomposition, and is finally volatilized without leaving a residue.

CANNABIS INDICA.**INDIAN CANNABIS.**

[INDIAN HEMP.]

The flowering tops of the female plant of *Cannabis sativa* Linné (nat. d. *Urticaceæ*), grown in the East Indies.

Branching, compressed, brittle, about 5 Cm. or more long, with a few digitate leaves, having linear-lanceolate leaflets, and numerous, sheathing, pointed bracts, each containing two small, pistillate flowers, sometimes with the nearly ripe fruit, the whole more or less agglutinated with a resinous exudation. It has a brownish-green color, a peculiar, narcotic odor, and a slightly acrid taste.

Preparations: Extractum Cannabis Indicæ. Extractum Cannabis Indicæ Fluidum. Tinctura Cannabis Indicæ.

CANTHARIS.**CANTHARIDES.**

[SPANISH FLIES.]

Cantharis vesicatoria De Geer (class *Insecta*; order *Colcoptera*).

Cantharides should be thoroughly dried at a temperature not exceeding 40° C. (104° F.), and kept in well-closed vessels.

About 25 Mm. long and 6 Mm. broad; flattish-cylindrical, with filiform antennæ, black in the upper part, and with long wing-cases and ample, membranous, transparent, brownish wings; elsewhere of a shining, coppery-green color. The powder is grayish-brown, and contains green, shining particles. Odor strong and disagreeable; taste slight, afterwards acrid.

Preparations: Ceratum Cantharidis. Collodium Cantharidatum. Tinctura Cantharidis.

CAPSICUM.**CAPSICUM.**

[CAYENNE PEPPER. AFRICAN PEPPER.]

The fruit of *Capsicum fastigiatum* Blume (nat. ord. *Solanaceæ*).

Oblong-conical, from 10 to 20 Mm. long, supported by a flattish, cup-shaped, five-toothed calyx, with a red, shining, membranous and translucent pericarp, enclosing two cells, and containing flat, reniform, yellowish seeds attached to a thick, central placenta. It has a peculiar odor, and an intensely hot taste.

Preparations: Extractum Capsici Fluidum. Oleoresina Capsici. Tinctura Capsici.

CARBO ANIMALIS.**ANIMAL CHARCOAL.**

Charcoal prepared from bone.

Dull black, granular fragments, or a dull black powder, odorless, nearly tasteless, and insoluble in water or alcohol.

When ignited, it leaves a grayish or yellowish-white ash, amounting to about 85 per cent. of the original weight of the portion taken, which should have been previously dried at 120°–125° C. (248°–257° F.) to a constant weight.

The ash should be soluble in hydrochloric acid with the aid of heat, leaving not more than a trifling residue.

If 1 Gm. of Animal Charcoal be boiled for several minutes with a mixture of 3 Cc. of potassium hydrate T.S. and 5 Cc. of water, the filtrate should be colorless or nearly so (evidence of *complete carbonization*).

Preparation: Carbo Animalis Purificatus.

CARBO ANIMALIS PURIFICATUS.**PURIFIED ANIMAL CHARCOAL.**

Animal Charcoal, in No. 60 powder, one hundred grammes	100 Gm.
Hydrochloric Acid, three hundred grammes	300 Gm.
Boiling Water, a sufficient quantity.	

Introduce the Animal Charcoal into a capacious flask, add *two hundred* (200) *grammes* of Hydrochloric Acid, and *one hundred* (100) *cubic centimeters* of Boiling Water, and connect the flask with an upright condenser. By means of a sand-bath keep the mixture gently boiling during eight hours. Then add *five hundred* (500) *cubic centimeters* of Boiling Water, transfer the mixture to a muslin strainer, and, when the liquid has run off, return the Charcoal to the flask. Add to it *one hundred* (100) *cubic centimeters*, each, of Hydrochloric Acid and of Boiling Water, boil for two hours, again add *five hundred* (500) *cubic centimeters* of Boiling Water, transfer the whole to a plain filter, and, when the liquid has run off, wash the residue with Boiling Water until the washings give only a faint cloudiness with silver nitrate test-solution. Dry the powder in a drying oven, and immediately transfer to well-stoppered vials.

A dull black powder, odorless, tasteless, and insoluble in water, alcohol, or other solvents.

If 2 Gm. of the powder be ignited at a red heat with free access of air in a broad, shallow porcelain or platinum dish, it should not leave a residue weighing more than 0.08 Gm., or 4 per cent. of the original weight (limit of *silicates* and *other fixed, inorganic matter*).

If 1 Gm. of the powder be boiled with a mixture of 3 Cc. of potassium hydrate T.S. and 5 Cc. of water during three minutes, the filtrate should be colorless (evidence of *complete carbonization*).

CARBO, LIGNI.

CHARCOAL.

Charcoal prepared from soft wood, and very finely powdered. Should be kept in well-closed vessels.

A black, odorless, and tasteless powder, free from gritty matter.

If 1 Gm. of Charcoal be boiled with a mixture of 3 Cc. of potassium hydrate T.S. and 5 Cc. of water for several minutes, the filtrate should be colorless or nearly so (evidence of *complete carbonization*).

CARBONEI DISULPHIDUM.

CARBON DISULPHIDE.

$$\text{CS}_2 = 75.93.$$

[CARBONEI BISULPHIDUM, PHARM. 1880.]

Carbon Disulphide should be kept in well-stoppered bottles, or in cans, in a cool place, remote from lights or fire.

A clear, colorless, highly refractive liquid, very diffusive, having a strong, characteristic, but not fetid odor, and a sharp, aromatic taste.

Soluble in 535 parts of water at 15° C. (59° F.); very soluble in alcohol, ether, chloroform, fixed and volatile oils.

Specific gravity: 1.268 to 1.269 at 15° C. (59° F.).

Carbon Disulphide vaporizes rapidly at the ordinary temperature, is highly inflammable, boils at 46°–47° C. (114.8°–116.6° F.), and, when ignited, burns with a blue flame, producing carbon and sulphur dioxide.

It should not affect the color of blue litmus paper moistened with water (absence of *sulphur dioxide*).

A portion evaporated spontaneously in a glass vessel should leave no residue (absence of *dissolved sulphur*). Lead acetate T.S. agitated with it should not be blackened (absence of *hydrogen sulphide*).

CARDAMOMUM.

CARDAMOM.

The fruit of *Elettaria repens* (Sonnerat) Baillon (nat. ord. *Scitamineæ*).

Ovoid or oblong, from 10 to 15 Mm. long, obtusely triangular, rounded at the base, beaked, longitudinally striate; of a pale buff color, three-celled, with a thin, leathery, nearly tasteless pericarp, and a central placenta. The seeds are about 4 Mm. long, reddish-brown, angular, rugose, depressed at the hilum, surrounded by a thin, membranous arillus, and have an agreeable odor and a pungent, aromatic taste.

Preparations: Pulvis Aromaticus. Tinctura Cardamomi. Tinctura Cardamomi Composita.

CARUM.

CARAWAY.

The fruit of *Carum Carvi* Linné (nat. ord. *Umbelliferae*).

Oblong, laterally compressed, about 4 or 5 Mm. long, usually separated into the two mericarps, which are curved, narrower at both ends, brown, with five yellowish, filiform ribs, and with six oil-tubes. Caraway has an agreeable odor, and a sweetish, spicy taste.

Preparation: Tinctura Cardamomi Composita.

CARYOPHYLLUS.

CLOVES.

The unexpanded flowers of *Eugenia aromatica* (Linné) O. Kuntze (nat. ord. *Myrtaceæ*).

About 15 Mm. long, dark brown, consisting of a subcylindrical, solid and glandular calyx-tube, terminated by four teeth, and surmounted by a globular head, formed by four petals, which cover numerous curved stamens, and one style. Cloves emit oil, when scratched, and have a strong, aromatic odor, and a pungent, spicy taste.

Preparation: Tinctura Lavandulae Composita.

CASCARILLA.

CASCARILLA.

The bark of *Croton Eluteria* Bennett (nat. ord. *Euphorbiaceæ*).

In quills or curved pieces about 2 Mm. thick, having a grayish, somewhat fissured, easily detached, corky layer, more or less coated with a white lichen, the uncoated surface being dull brown, and the inner surface smooth. It breaks with a short fracture, having a resinous and radially striate appearance. When burned, it emits a strong, aromatic, somewhat musk-like odor; its taste is warm and very bitter.

CASSIA FISTULA.

CASSIA FISTULA.

[PURGING CASSIA.]

The fruit of *Cassia Fistula* Linné (nat. ord. *Leguminosæ*).

Cylindrical, 40 to 60 Cm. long, nearly 25 Mm. in diameter, blackish-brown, somewhat veined, the sutures smooth, forming two longitudinal bands; indurated, internally divided transversely into numerous cells, each containing a reddish-brown, glossy, flattish-ovate seed imbedded in a blackish-brown sweet pulp; odor resembling that of prunes.

Preparation: Confectio Sennæ.

CASTANEA.

CASTANEA.

[CHESTNUT.]

The leaves of *Castanea dentata* (Marshall) Sudworth (nat. ord. *Curculiferæ*), collected in September or October, while still green.

From 15 to 25 Cm. long, about 5 Cm. wide, petiolate, oblong-lanceolate, acuminate, mucronate, feather-veined, sinuate-serrate, smooth; odor slight; taste somewhat astringent.

Preparation: Extractum Castanæ Fluidum.

CATECHU.

CATECHU.

An extract prepared from the wood of *Acacia Catechu* (Linné fil.) Willdenow (nat. ord. *Leguminosæ*).

In irregular masses, containing fragments of leaves, dark brown, brittle, somewhat porous and glossy when freshly broken. It is nearly inodorous, and has a strongly astringent and sweetish taste.

If a portion of Catechu be digested with 10 times its weight of alcohol, and the liquid filtered, the undissolved matter, after being dried at 100° C. (212° F.), should not exceed 15 per cent. of the original weight.

The tincture, diluted with 100 parts of water, acquires a green color on the addition of ferric chloride T.S.

If 2 parts of Catechu be boiled with 20 parts of water, a brownish-red, turbid liquid will be obtained which turns blue litmus paper red.

Upon incineration, Catechu should not leave more than 6 per cent. of ash.

Preparations: Tinctura Catechu Composita. Trochisci Catechu.

CAULOPHYLLUM.

CAULOPHYLLUM.

[BLUE COHOSH.]

The rhizome and roots of *Caulophyllum thalictroides* (Linné) Michaux (nat. ord. *Berberidaceæ*).

Rhizome of horizontal growth, about 10 Cm. long, and about 6 to 10 Mm. thick, bent; on the upper side with broad, concave stem-scars and short, knotty branches; externally grayish-brown, internally whitish, tough and woody. Roots numerous, matted, about 10 Cm. long, and 1 Mm. thick, rather tough; nearly inodorous; taste sweetish, slightly bitter and somewhat acrid.

CERA ALBA.

WHITE WAX.

Yellow Wax, bleached.

A yellowish-white solid, somewhat translucent in thin layers, having a slightly rancid odor, and an insipid taste.

Specific gravity: 0.965 to 0.975 at 15° C. (59° F.). Melting point: about 65° C. (149° F.).

In other respects White Wax has the characteristics of, and should respond to the reactions and tests given under, Yellow Wax (see *Cera Flava*).

Preparations: Ceratum. (Compound Cerates.)

CERA FLAVA.

YELLOW WAX.

A peculiar, concrete substance, prepared by *Apis mellifica* Linné (class *Insecta*; order *Hymenoptera*).

A yellowish to brownish-yellow solid, having an agreeable, honey-like odor, and a faint, balsamic taste.

Specific gravity: 0.955–0.967 at 15° C. (59° F.). Melting point: 63°–64° C. (145.4°–147.2° F.).

It is brittle when cold, and when broken presents a dull, granular, not crystalline fracture. By the heat of the hand it becomes plastic.

Yellow Wax is insoluble in water, sparingly soluble in cold alcohol, but almost completely in boiling alcohol. It is completely soluble in ether, chloroform, and in fixed and volatile oils; partially soluble in cold benzol or carbon disulphide, and completely in these liquids at a temperature of 25° to 30° C. (77° to 86° F.).

If 1 Gm. of Yellow Wax be boiled, for half an hour, with 35 Cc. of a 15-per-cent. aqueous solution of sodium hydrate, the volume being preserved by the occasional addition of water, the Wax should separate, on cooling, without rendering the liquid opaque, and no precipitate should be produced in the filtered liquid by hydrochloric acid (absence of *fats* or *fatty acids*, *Japan wax*, *resin*); nor should the same reagent produce a precipitate in water which has been boiled with a portion of the Wax (absence of *soap*).

If 5 Gm. of Yellow Wax be heated in a flask, for fifteen minutes, with 25 Cc. of sulphuric acid, to 160° C. (320° F.), and the mixture then diluted with water, no solid, wax-like body should separate (absence of *paraffin*).

If a portion of Yellow Wax be ignited on platinum, it should not emit the odor of acrolein (absence of *tallow* and *other fats*).

Preparations : Ceratum Resinæ. (Compound Cerates.) Emplastrum Resinæ. Unguentum.

CERATUM.

CERATE.

White Wax, <i>three hundred grammes</i>	300 Gm.
Lard, <i>seven hundred grammes</i>	700 Gm.
To make <i>one thousand grammes</i>	1000 Gm.

Melt them together, and stir the mixture constantly until it is cool.

CERATUM CAMPHORÆ.

CAMPBOR CERATE.

Camphor Liniment, <i>one hundred grammes</i>	100 Gm.
White Wax, <i>three hundred grammes</i>	300 Gm.
Lard, <i>six hundred grammes</i>	600 Gm.
To make <i>one thousand grammes</i>	1000 Gm.

Melt the White Wax and Lard with the aid of a gentle heat; then add the Camphor Liniment, and stir the mixture occasionally, until it has become cold.

CERATUM CANTHARIDIS.

CANTHARIDES CERATE.

Cantharides, in No. 60 powder, <i>three hundred and twenty grammes</i>	320 Gm.
Yellow Wax, <i>one hundred and eighty grammes</i>	180 Gm.
Resin, <i>one hundred and eighty grammes</i>	180 Gm.
Lard, <i>two hundred and twenty grammes</i>	220 Gm.
Oil of Turpentine, <i>one hundred and fifty cubic centimeters</i> ..	150 Cc.
To make <i>one thousand grammes</i>	1000 Gm.

Moisten the Cantharides with the Oil of Turpentine, and set the mixture aside, well covered, for forty-eight hours. Then add it to the Yellow Wax, Resin, and Lard, previously melted and strained through

muslin, and keep the mixture in a liquid condition, by means of a water-bath, stirring occasionally, until its weight has been reduced to *one thousand (1000) grammes*. Then remove it from the bath, and stir it occasionally until it is cool.

Preparation: *Emplastrum Picis Cantharidatum*.

CERATUM CETACEI.

SPERMACETI CERATE.

Spermaceti, <i>one hundred grammes</i>	100 Gm.
White Wax, <i>three hundred and fifty grammes</i>	350 Gm.
Olive Oil, <i>five hundred and fifty grammes</i>	550 Gm.
To make <i>one thousand grammes</i>	1000 Gm.

Melt together the Spermaceti and White Wax; then add the Olive Oil previously heated, and stir the mixture constantly until it is cool.

CERATUM PLUMBI SUBACETATIS.

CERATE OF LEAD SUBACETATE.

[GOULARD'S CERATE.]

Solution of Lead Subacetate, <i>two hundred grammes</i> ...	200 Gm.
Camphor Cerate, <i>eight hundred grammes</i>	800 Gm.
To make <i>one thousand grammes</i>	1000 Gm.

Mix them thoroughly.

This Cerate should be freshly prepared, when wanted.

CERATUM RESINÆ.

RESIN CERATE.

[BASILICON OINTMENT.]

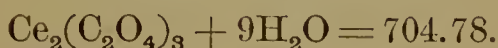
Resin, <i>three hundred and fifty grammes</i>	350 Gm.
Yellow Wax, <i>one hundred and fifty grammes</i>	150 Gm.
Lard, <i>five hundred grammes</i>	500 Gm.

To make *one thousand grammes* 1000 Gm.

Melt them together at a moderate heat, strain the mixture through muslin, and allow it to cool without stirring.

In cold weather use the following proportions:

Resin, *three hundred and fifty (350) grammes*; Yellow Wax, *one hundred and twenty (120) grammes*; Lard, *five hundred and thirty (530) grammes*.

CERII OXALAS.**CERIUM OXALATE.**

[CEROUS OXALATE.]

A white, granular powder, without odor or taste, and permanent in the air. Insoluble in water, alcohol, ether, or in solutions of potassium or sodium hydrate; soluble in diluted sulphuric or hydrochloric acid.

When heated to redness, it is decomposed, leaving a residue of reddish-yellow ceric oxide (a brown color would indicate the presence of *didymium*).

On boiling the salt with potassium or sodium hydrate T.S., white cerous hydrate is left as insoluble residue, while in the filtrate, supersaturated with acetic acid, calcium chloride T.S. will produce a white precipitate insoluble in acetic acid, but soluble in hydrochloric acid.

If the yellow residue, left after heating, be dissolved in concentrated sulphuric acid, and a small crystal of strychnine added, a deep blue color will appear, which will rapidly change to purple and then to red.

From the solution in diluted hydrochloric or sulphuric acid, potassium hydrate T.S. precipitates white, cerous hydrate, which does not redissolve in an excess of the reagent, and gradually turns yellow in contact with air.

Ammonium carbonate T.S. precipitates white, cerous carbonate, which is somewhat soluble in an excess of the reagent.

If 0.1 Gm. of Cerium Oxalate be dissolved in 1 Cc. of sulphuric acid, and 2 Cc. of potassium sulphate T.S. be added, small, colorless crystals of cerium potassium sulphate will be deposited after some time.

No effervescence should occur when the salt is dissolved in diluted hydrochloric acid (absence of *carbonate*); nor should the solution be colored or rendered turbid on the addition of an equal volume of hydrogen sulphide T.S. (absence of *arsenic*, etc.).

On boiling the salt with potassium or sodium hydrate T.S. and filtering, no precipitate should be produced in the filtrate either by ammonium chloride T.S. (absence of *aluminum*), or by ammonium sulphide T.S. (absence of *zinc*).

CETACEUM.**SPERMACETI.**

A peculiar, concrete, fatty substance, obtained from *Physeter macrocephalus* Linné (class *Mammalia*; order *Cetacea*).

White, somewhat translucent, slightly unctuous masses of a scaly-crystalline fracture and a pearly lustre; odorless, and having a bland, mild taste. It becomes yellowish and rancid by exposure to air.

Specific gravity: about 0.945 at 15° C. (59° F.). It melts near 50° C. (122° F.), and congeals near 45° C. (113° F.).

Insoluble in water, and nearly so in cold alcohol; soluble in boiling alcohol; also in ether, chloroform, carbon disulphide, fixed and volatile oils; only slightly soluble in cold benzin.

An alcoholic solution of Spermaceti is neutral to litmus paper.

If 1 Gm. of Spermaceti be boiled with 1 Gm. of anhydrous sodium carbonate and 50 Cc. of alcohol, and the mixture cooled and filtered, the filtrate, upon being supersaturated with acetic acid, may become turbid, but should not afford a precipitate (absence of *stearic acid*).

Preparations: Ceratum Cetacei. Unguentum Aquæ Rosæ.

CETRARIA.

CETRARIA.

[ICELAND MOSS.]

Cetraria islandica (Linné) Acharius (class *Lichenes*).

From 5 to 10 Cm. long, foliaceous, irregularly branched into fringed and channelled lobes, brownish above, whitish beneath, and marked with small, depressed spots; brittle and inodorous; when softened in water, cartilaginous, and having a slight odor; its taste is mucilaginous and bitter.

It should be freed from pine leaves, mosses, and other lichens, which are frequently found mixed with it.

Preparation: Decoctum Cetrariæ.

CHARTA POTASSII NITRATIS.

POTASSIUM NITRATE PAPER.

Potassium Nitrate, *two hundred grammes* 200 Gm.

Distilled Water, *eight hundred cubic centimeters* 800 Cc.

Dissolve the Potassium Nitrate in the Distilled Water. Immerse strips of white, unsized paper in the solution, and dry them.

Keep the paper in well-closed vessels.

CHARTA SINAPIS.

MUSTARD PAPER.

Black Mustard, in No. 60 powder, *one hundred grammes*.. 100 Gm.

India-Rubber, *ten grammes*..... 10 Gm.

Benzin,

Carbon Disulphide, each, *a sufficient quantity*.

Pack the Black Mustard in a conical percolator, and gradually pour Benzin upon it until the percolate ceases to produce a permanent, greasy stain upon blotting paper. Remove the powder from the percolator, and dry it by exposure to the air. Having meanwhile dissolved the India-Rubber in a mixture of *one hundred* (100) *cubic centimeters*, each, of Benzin and Carbon Disulphide, mix the purified Mustard with a sufficient quantity of the solution to produce a semi-liquid magma, and apply this, by means of a suitable brush, to one side of a piece of rather stiff, well-sized paper, so as to cover it completely, and then allow the surface to dry.

A surface of sixty square centimeters should contain about 4 Gm. of Black Mustard deprived of oil.

Before it is applied to the skin, Mustard Paper should be dipped in warm water for about fifteen seconds.

CHELIDONIUM.**CHELIDONIUM.**

[CELANDINE.]

The entire plant, *Chelidonium majus* Linné (nat. ord. *Papaveraceæ*).

Root several-headed, branching, reddish-brown; stem about 50 Cm. long, light green, hairy; leaves about 15 Cm. long, thin, petiolate, the upper ones smaller and sessile, light green, on the lower side glaucous, lyrate-pinnatifid, the pinnæ ovate-oblong, obtuse, coarsely crenate or incised and the terminal one often three-lobed; flowers in small, long-peduncled umbels with two sepals and four yellow petals; capsule linear, two-valved and many-seeded. The fresh plant contains a saffron-colored milk-juice, and has an unpleasant odor and acrid taste.

CHENOPODIUM.**CHENOPODIUM.**

[AMERICAN WORMSEED.]

The fruit of *Chenopodium ambrosioides* Linné, and variety *anthelminthicum* Gray (nat. ord. *Chenopodiaceæ*).

Nearly 2 Mm. in diameter, depressed-globular, glandular, dull greenish or brownish, the integuments friable, and containing a lenticular, obtusely-edged, glossy, black seed. It has a peculiar, somewhat terebinthinate odor, and a bitterish, pungent taste.

CHIMAPHILA.**CHIMAPHILA.**

[PIPSISSEWA.]

The leaves of *Chimaphila umbellata* (Linné) Nuttall (nat. ord. *Ericaceæ*.)

About 5 Cm. long, oblanceolate, sharply serrate above, wedge-shaped and nearly entire towards the base; coriaceous, smooth, and dark green on the upper surface. It is nearly inodorous, and has an astringent and bitterish taste.

Preparation: Extractum Chimaphilæ Fluidum.

CHIRATA.**CHIRATA.**

The entire plant, *Swertia Chirata* Hamilton (nat. ord. *Gentianeæ*).

Root nearly simple, about 7 Cm. long; stem branched, nearly 1 meter long, slightly quadrangular above; containing a narrow wood-circle and a large yellowish pith. Leaves opposite, sessile, ovate, entire, five-nerved. Flowers numerous, small, with a four-lobed calyx and corolla. The whole plant smooth, pale brown, inodorous, and intensely bitter.

Preparations: Extractum Chiratæ Fluidum. Tinctura Chiratæ.

CHLORAL.

CHLORAL.



[CHLORAL HYDRATE.]

A crystalline solid, composed of Trichloraldehyde or Chloral with one molecule of water.

It should be kept in glass-stoppered bottles, in a cool and dark place.

Separate, rhomboidal, colorless and transparent crystals, having an aromatic, penetrating, and slightly acrid odor, and a bitterish, caustic taste; slowly volatilized when exposed to the air.

Freely soluble in water, alcohol, or ether; also in chloroform, benzol, benzin, carbon disulphide, fixed and volatile oils. It liquefies when triturated with about an equal quantity of camphor, menthol, thymol, or carbolic acid.

When heated to about 58° C. (136.4° F.), it melts, forming a liquid having a specific gravity of about 1.575, which, at a higher temperature, should not evolve inflammable vapors. Liquefied Chloral solidifies to a crystalline mass between 35° and 50° C. (95° and 122° F.).

Chloral is decomposed by caustic alkalis, alkaline earths, and ammonia, chloroform being formed, and a formate of the base produced.

A freshly prepared, aqueous solution of Chloral is neutral, but gradually acquires an acid reaction. A neutral alcoholic solution remains neutral permanently.

Chloral should be dry, and not readily attract moisture in dry air.

A solution of Chloral (1 in 20) in diluted alcohol, acidulated with nitric acid, should remain unaffected by silver nitrate T.S. (absence of *hydrochloric acid* and *chlorides*).

If 1 Gm. of Chloral be dissolved in 2 Cc. of warm water, mixed with potassium hydrate T.S. in slight excess (about 8 Cc.), the mixture filtered, and a portion of the clear filtrate treated with iodine T.S. until it is yellowish, no yellow, crystalline precipitate (iodoform) should appear within half an hour (absence of *chloral alcoholate*).

CHLOROFORMUM.

CHLOROFORM.



[CHLOROFORMUM PURIFICATUM, PHARM. 1880.]

A liquid consisting of 99 to 99.4 per cent., by weight, of absolute Chloroform, and 1 to 0.6 per cent. of Alcohol.

It should be kept in dark amber-colored, glass-stoppered bottles, in a cool and dark place.

A heavy, clear, colorless, mobile and diffusible liquid, of a characteristic, ethereal odor, and a burning, sweet taste.

Specific gravity: not below 1.490 at 15° C. (59° F.), or 1.473 at 25° C. (77° F.). Soluble in about 200 times its volume of cold water, and, in all proportions, in alcohol, ether, benzol, benzin, and the fixed and volatile oils.

Chloroform is volatile even at a low temperature, and boils at 60° to 61° C. (140° to 141.8° F.). It is not inflammable, but its heated vapor burns with a green flame.

If 20 Cc. of Chloroform be poured upon a clean, odorless filter laid flat upon a warmed porcelain or glass plate, and the plate be rocked from side to side until the liquid is all evaporated, no foreign odor should become perceptible as the last portions disappear from the paper, and the paper should be left nearly odorless when compared with a new, odorless filter.

If 10 Cc. of Chloroform be well shaken with 20 Cc. of distilled water, and the liquid be allowed to separate completely, the water should be neutral to litmus paper, and should not be affected by silver nitrate T.S. (absence of *chlorides*), or potassium iodide T.S. (absence of *free chlorine*).

If to about 5 Cc. of Chloroform, contained in a dry test-tube of the capacity of about 10 Cc., about 4 Cc. of perfectly clear barium hydrate T.S. be added without agitation, and the test-tube be then corked and set aside in a dark place for six hours, no film should be visible at the line of contact of the two liquids (absence of *products of decomposition* in Chloroform which may be otherwise pure).

If 40 Cc. of chloroform be shaken with 4 Cc. of colorless, concentrated sulphuric acid in a 50 Cc. glass-stoppered cylinder during twenty minutes, and the liquids be then allowed to separate completely so that both are transparent, the chloroform should remain colorless, and the acid should appear colorless, or very nearly colorless, when seen in a stratum of not less than about 15 Mm. in thickness (absence of *impurities decomposable by sulphuric acid*).

If 2 Cc. of the sulphuric acid, separated from the Chloroform, be diluted with 5 Cc. of distilled water, the liquid should be colorless and clear, and, while hot from the mixing, should be odorless, or give but a faint vinous or ethereal odor (absence of *odorous decomposition products*). When further diluted with 10 Cc. of distilled water, it should remain clear, and should not be affected by silver nitrate T.S. (absence of *chlorinated compounds*).

If 10 Cc. of the Chloroform, separated from the acid, be well shaken with 20 Cc. of distilled water, and the liquid be allowed to separate completely, the watery portion should not be affected by silver nitrate T.S. (absence of *chlorinated compounds*).

Purification. Chloroform which fails to respond to these tests should be purified by the following process :

Chloroform, four hundred grammes	400 Gm.
Sulphuric Acid, eighty grammes	80 Gm.
Dried Sodium Carbonate, twenty grammes.....	20 Gm.
Deodorized Alcohol, four cubic centimeters.....	4 Cc.

Add the Sulphuric Acid to the Chloroform, contained in a glass-stoppered bottle, and shake them together occasionally during twenty-four hours, avoiding exposure to bright daylight. Separate the lighter Chloroform layer, add to it the Dried Sodium Carbonate, previously rendered anhydrous by heating it in a porcelain capsule on a sand-bath until it ceases to give off aqueous vapor, and shake them together frequently and thoroughly during half an hour. Then transfer the Chloroform to a dry retort, add to it the Alcohol, and distil, by means of a water-bath, at a temperature not exceeding 67.2° C. (153° F.), into a well-cooled, tared receiver, until the distillate measures *two hundred and fifty-five (255) cubic centimeters*.

Preparations : Aqua Chloroformi. Emulsum Chloroformi. Linimentum Chloroformi. Spiritus Chloroformi.

CHONDRUS.

CHONDRUS.

[IRISH MOSS. CARRAGHEEN.]

Chondrus crispus Stackhouse, and *Gigartina mamillosa* J. Agardh (class *Algæ*).

Yellowish or white, horny, translucent ; many-times forked ; when softened in water, cartilaginous ; shape of the segments varying from wedge-shaped to linear ; at the apex emarginate or two-lobed. It has a slight sea-weed odor, and a mucilaginous, somewhat saline taste.

One part of it boiled for ten minutes with 30 parts of water yields a solution which gelatinizes on cooling, and is not colored blue by iodine T.S.

CHRYSAROBINUM.

CHRYSAROBIN.

A neutral principle, in its commercial, more or less impure form, extracted from Goa Powder, a substance found deposited in the wood of *Andira Araroba* Aguiar (nat. ord. *Leguminosæ*).

A pale orange-yellow, microcrystalline powder, odorless and tasteless; turning brownish-yellow on exposure to air.

Very slightly soluble in cold water or alcohol; soluble, without leaving more than a small residue, in 150 parts of boiling alcohol; also soluble in 33 parts of boiling benzol, and in solutions of the alkalies.

When heated to 151° C. (303.8° F.), it fuses, forming a dark, opaque mass; and, when ignited, it is partly sublimed, and finally consumed without leaving a residue.

When boiled with about 2000 parts of water (which produces only partial solution), the light reddish-brown filtrate does not affect litmus paper, and is not altered by ferric chloride T.S.

In concentrated sulphuric acid it is soluble with a deep-red color; on pouring this solution into water, the substance is again deposited unchanged.

On adding 0.1 Gm. of Chrysarobin to 10 Cc. of potassium or sodium hydrate T.S., in a test-tube, and shaking the latter, the solution, which is at first yellow or yellowish-red, will gradually acquire a deep-red color.

Preparation: Unguentum Chrysarobini.

CIMICIFUGA.

CIMICIFUGA.

[BLACK SNAKEROOT.]

The rhizome and roots of *Cimicifuga racemosa* (Linné) Nuttall (nat. ord. *Ranunculaceæ*).

The rhizome is of horizontal growth, hard, 5 Cm. or more long, about 25 Mm. thick, with numerous stout, upright or curved branches, terminated by a cup-shaped scar, and with numerous wiry, brittle, obtusely quadrangular roots, about 2 Mm. thick; the whole brownish-black, of a slight but heavy odor, and of a bitter, acrid taste.

Rhizome and branches have a smooth fracture, with a rather large pith, surrounded by numerous sublinear, whitish wood-rays, and a thin, firm bark. The roots break with a short fracture, have a thick bark, and contain a ligneous cord expanding into about four rays.

Preparations: Extractum Cimicifugæ. Extractum Cimicifugæ Fluidum. Tinctura Cimicifugæ.

CINCHONA.

CINCHONA.

The bark of *Cinchona Calisaya* Weddell, *Cinchona officinalis* Linné, and of hybrids of these and of other species of *Cinchona* (nat. ord. *Rubiaceæ*), yielding, when assayed by the process given below, not less than 5 per cent. of total alkaloids, and at least 2.5 per cent. of quinine ($C_{20}H_{24}N_2O_2 + H_2O = 341.3$).

In quills or incurved pieces, varying in length, and usually 2 or 3, or sometimes 5 Mm. thick; the outer surface covered with a gray or brownish-gray cork, usually slightly wrinkled, marked with transverse, and also with intersecting, longitudinal fissures (*C. Calisaya*), and sometimes with scattered warts and slight longitudinal ridges; inner surface light cinnamon-brown, very finely striate; fracture short and granular in the outer layer, and finely fibrous in the inner layer; powder light brown or yellowish-brown; odor slight, somewhat aromatic; taste bitter and somewhat astringent.

Preparations: Extractum Cinchonæ. Extractum Cinchonæ Fluidum. Infusum Cinchonæ. Tinctura Cinchonæ.

Assay of Cinchona.

I. FOR TOTAL ALKALOIDS.

Cinchona, in No. 80 (or finer) powder, and completely dried at 100° C. (212° F.), *twenty grammes* 20 Gm.
 Alcohol,
 Ammonia Water,
 Chloroform,
 Ether,
 Normal Sulphuric Acid (V.S.),
 Potassium Hydrate V.S., each, *a sufficient quantity*.

To 20 Gm. of Cinchona, in very fine powder, and contained in a bottle provided with an accurately ground glass stopper, add 200 Cc. of a previously prepared mixture of 19 volumes of alcohol, 5 volumes of chloroform, and 1 volume of ammonia water, stopper the bottle, and shake it thoroughly and frequently during four hours. Then separate the liquid by pouring it into another bottle through a funnel containing a pellet of cotton, in such a manner that no material loss by evaporation may result. Transfer 100 Cc. of the clear filtrate (representing 10 Gm. of Cinchona) to a beaker, and evaporate it to dryness. Dissolve the residue of crude alkaloids thus obtained in 10 Cc. of water and 4 Cc. of normal sulphuric acid, with the aid of a gentle heat, filter the cooled solution into a separatory funnel, and wash the beaker and filter until the filtrate no longer has an acid reaction, using as small a quantity of water as possible. Now add 5 Cc. of potassium hydrate V.S., or such an amount as will render the liquid decidedly alkaline, and extract the alkaloids by shaking the mixture, first with 20 Cc., and then repeatedly with 10 Cc., of chloroform, until a drop of the last chloroform extraction, when evaporated on a watch-glass, no longer leaves a residue. Evaporate the united chloroformic extracts in a tared beaker, dry the residue at 100° C. (212° F.), and weigh. The weight found, multiplied by *ten* (10), will give the percentage of *total alkaloids* in the specimen of Cinchona tested.

II. FOR QUININE.

Transfer 50 Cc. of the clear filtrate remaining over from the preceding process (and representing 5 Gm. of Cinchona) to a beaker, evaporate it to dryness, and proceed as directed in the assay for total alkaloids, using, however, only one-half the amounts of volumetric acid and alkali there directed. Add the united chloroformic extracts containing the alkaloids in solution, gradually, and in small portions at a time, to about 5 Gm. of powdered glass contained in a porcelain capsule placed over a water-bath, so that, when the contents of the capsule are dry, all or nearly all of the dry alkaloids shall be in intimate admixture with the powdered glass, and the chloroform be completely expelled. Now moisten the residue with ether, and, having placed a funnel containing a filter of a diameter of 7 Cm., and well wetted with ether, over a small graduated tube (A), transfer to the filter the ether-moistened residue from the capsule. Rinse the latter several times, if necessary, with fresh ether, so as to transfer the whole of the residue to the filter, then percolate with ether added drop by

drop, until exactly 10 Cc. of percolate have been obtained. Then collect another volume of 10 Cc., by similar, slow percolation with ether, in a second graduated tube (B). Transfer the contents of the two tubes completely (using ether for washing) to two small, tared capsules, properly marked (A and B) so as to avoid confusion, evaporate to a constant weight at 100° C. (212° F.), and weigh them. (The residue in A will contain practically all the quinine, together with a portion of the alkaloids less soluble in ether; the residue in B will consist almost entirely of these alkaloids.) From the amount of residue obtained in capsule A deduct that contained in B, and multiply the remainder by *twenty* (20). The product will represent, approximately, the percentage of *quinine* (containing 1 molecule of water) in the specimen of *Cinchona* tested.

CINCHONA RUBRA.

RED CINCHONA.

The bark of *Cinchona succirubra* Pavon (nat. ord. *Rubiaceæ*), containing not less than 5 per cent. of its peculiar alkaloids.

In quills or incurved pieces, varying in length, and from 2 to 4 or 5 Mm. thick; the outer surface covered with a grayish-brown cork, more or less rough from warts and longitudinal, warty ridges, and from few, mostly short, transverse fissures; inner surface more or less deep reddish-brown and distinctly striate; fracture short-fibrous in the inner layer; powder reddish-brown; odor slight; taste bitter and astringent.

Preparation: Tinctura Cinchonæ Composita.

CINCHONIDINÆ SULPHAS.

CINCHONIDINE SULPHATE.



The neutral sulphate of an alkaloid obtained from the bark of various species of *Cinchona*.

White, silky, acicular crystals, without odor, and having a very bitter taste; slightly efflorescent on exposure to air.

Soluble, at 15° C. (59° F.), in 70 parts of water, and in 66 parts of alcohol; in 1.42 parts of boiling water, and in 8 parts of boiling alcohol. Also soluble in 1316 parts of chloroform, and almost insoluble in ether. The presence of sulphates of other cinchona alkaloids increases its solubility in ether and chloroform.

At 100° C. (212° F.) the salt gives off its water of crystallization. At 215° C. (419° F.) it melts, and, when ignited, it is consumed without leaving a residue.

The salt is neutral, or has a faintly alkaline reaction on litmus paper.

On adding ammonia water to the aqueous solution of the salt, a white precipitate (cinchonidine) is produced, which is but slightly soluble in ammonia, but dissolves in about 75 parts of ether.

If concentrated sulphuric acid be added to a small quantity of the salt, not more than a faintly yellowish color should be developed (limit of *readily carbonizable, organic impurities*). Upon adding to this liquid a crystal of potassium dichromate, a yellowish-green color is produced, which gradually changes to grass-green.

Addition of barium chloride T.S. to an aqueous solution of the salt produces a white precipitate insoluble in hydrochloric acid.

A solution of the salt (about 1 in 1000) in diluted sulphuric acid should not exhibit more than a faint blue fluorescence (absence of more than traces of the *sulphates of quinine or quinidine*).

If 1 Gm. of the salt be dried at 100° C. (212° F.) until it ceases to lose weight, the residue, cooled in a desiccator, should weigh not less than 0.920 Gm. (absence of an *undue amount of water*).

If 0.5 Gm. of the salt be macerated, with frequent agitation, at the ordinary temperature, with 20 Cc. of water, 0.5 Gm. of potassium sodium tartrate then added, the maceration continued, under repeated agitation, for one hour at 15° C. (59° F.), and the mixture then filtered, the addition of one drop of ammonia water to the filtrate should not produce more than a slight turbidity (absence of more than small proportions of the *sulphates of cinchonine or quinidine*).

CINCHONINA.

CINCHONINE.



An alkaloid obtained from the bark of various species of *Cinchona*.

White, lustrous prisms or needles, without odor, at first almost tasteless, but soon developing a bitter after-taste; permanent in the air.

Soluble, at 15° C. (59° F.), in 3760 parts of water, and in 116 parts of alcohol; in 3500 parts of boiling water, and in 26.5 parts of boiling alcohol. Also soluble in 526 parts of ether, and in 163 parts of chloroform.

At 240° C. (464° F.) the crystals fuse together, and at 258° C. (496.4° F.) they melt, forming a brown liquid. When ignited, they are consumed without leaving a residue.

When placed on moistened, red litmus paper, Cinchonine shows an alkaline reaction.

On adding to a neutral or not more than faintly acid solution of Cinchonine, or of any of its salts, enough potassium ferrocyanide T.S. to redissolve the precipitate first formed, and afterwards an acid, a golden-yellow precipitate will be formed, which, when redissolved by gently warming the liquid, will separate, on cooling, in minute scales or needles.

On adding an excess of ammonia water to a solution of Cinchonine in a dilute acid, the alkaloid will be precipitated.

The precipitate is but feebly soluble in ammonia, and should require not less than 300 parts of ether for solution.

A solution of Cinchonine (1 in 1000) in diluted sulphuric acid should not exhibit more than a faint blue fluorescence (absence of more than traces of *quinine* or *quinidine*).

Cinchonine should not impart more than a faintly yellowish tinge to concentrated sulphuric acid (limit of *readily carbonizable, organic impurities*).

CINCHONINÆ SULPHAS.

CINCHONINE SULPHATE.



Hard, white, lustrous, prismatic crystals, without odor, and having a very bitter taste; permanent in the air.

Soluble, at 15° C. (59° F.), in 66 parts of water, and in 10 parts of alcohol; in 13.59 parts of boiling water, and in 3.25 parts of boiling alcohol. Also soluble in 78 parts of chloroform, but almost insoluble in ether.

At 100° C. (212° F.) it gives off its water of crystallization, and at 215° C. (419° F.) it melts, forming a brown liquid. When ignited, it is consumed without leaving a residue.

The salt is neutral to litmus paper.

Addition of ammonia to an aqueous solution of the salt produces a white precipitate which should respond to the reactions and tests given under *Cinchonina*.

On adding barium chloride T.S. to an aqueous solution of the salt, a white precipitate is produced, which is insoluble in hydrochloric acid.

A solution of the salt (1 in 1000) in diluted sulphuric acid should not exhibit more than a faint blue fluorescence (limit of *quinine* or *quinidine*).

If 1 Gm. of the salt be dried at 100° C. (212° F.) until it ceases to lose weight, the residue, cooled in a desiccator, should weigh not less than 0.95 Gm. (absence of an *undue amount of water*).

If 1 part of the salt, reduced to powder, be macerated, with frequent agitation, at the ordinary temperature, with 80 parts of chloroform, it should wholly, or almost wholly, dissolve (limit of *quinine* or *cinchonidine*).

The salt should not impart more than a faintly yellowish tinge to concentrated sulphuric acid (limit of *readily carbonizable, organic impurities*).

CINNAMOMUM CASSIA.

CASSIA CINNAMON.

[CINNAMOMUM, PHARM. 1880. CASSIA BARK.]

The bark of the shoots of one or more undetermined species of *Cinnamomum* grown in China (Chinese Cinnamon) (nat. ord. *Laurineæ*).

In quills of varying length and about 1 Mm. or more in thickness; nearly deprived of the corky layer; yellowish-brown; outer surface somewhat rough; fracture nearly smooth; odor fragrant; taste sweet, and warmly aromatic.

Preparations: Tinctura Cardamomi Composita. Tinctura Catechu Composita. Tinctura Lavandulæ Composita.

CINNAMOMUM SAIGONICUM.

SAIGON CINNAMON.

The bark of an undetermined species of *Cinnamomum* (nat. ord. *Laurineæ*).

In quills about 15 Cm. long, and 10 to 15 Mm. in diameter, the bark 2 or 3 Mm. thick; outer surface gray or light grayish-brown with whitish patches, more or less rough from numerous warts and some transverse ridges and fine longitudinal wrinkles; the inner surface cinnamon-brown or dark brown, granular and slightly striate; fracture short, granular, in the outer layer cinnamon-colored, having near the cork numerous whitish striæ forming an almost uninterrupted line; odor fragrant; taste sweet, warmly aromatic, somewhat astringent.

CINNAMOMUM ZEYLANICUM.

CEYLON CINNAMON.

[CINNAMOMUM, PHARM. 1880.]

The inner bark of the shoots of *Cinnamomum zeylanicum* Breyne (nat. ord. *Laurineæ*).

Long, closely rolled quills, composed of eight or more layers of bark of the thickness of paper; pale yellowish-brown; outer surface smooth, marked with wavy lines of bast-bundles; inner surface striate; fracture short-splintery; odor fragrant; taste sweet and warmly aromatic.

Preparations: Pulvis Aromaticus. Tinctura Cinnamomi.

COCA.

COCA.

[ERYTHROXYLON, PHARM. 1880.]

The leaves of *Erythroxylon Coca* Lamarek (nat. ord. *Lineæ*).

Varying between ovate, lanceolate, and obovate-oblong, and from 2 to 5 or 7 Cm. in length; short-petiolate, entire, rather obtuse or emarginate at the apex, slightly reticulate on both sides, with a prominent midrib, and on each side of it a curved line running from base to apex; odor slight and tea-like; taste somewhat aromatic and bitter. When chewed, it temporarily benumbs the lips and tongue.

Preparation: Extractum Cocæ Fluidum.

COCAINÆ HYDROCHLORAS.

COCAINE HYDROCHLORATE.



The hydrochlorate of an alkaloid obtained from Coca.

Colorless, transparent crystals, or a white, crystalline powder, without odor, of a saline, slightly bitter taste and producing upon the tongue a tingling sensation followed by numbness of some minutes' duration. Permanent in the air.

Soluble, at 15° C. (59° F.), in 0.48 part of water, and in 3.5 parts of alcohol; very soluble in boiling water, and in boiling alcohol; also soluble in 2800 parts of ether, or in 17 parts of chloroform.

On heating a small quantity of the powdered salt for twenty minutes at a temperature of 100° C. (212° F.), it should not suffer any material loss (absence of *water of crystallization*). The prolonged application of heat to the salt, or to its solution, induces decomposition. At 193° C. (379.4° F.) the salt melts with partial sublimation, forming a light brownish-yellow liquid. When ignited, it is consumed without leaving a residue.

The salt is neutral to litmus paper.

On adding 5 drops of a 5-per-cent. solution of chromic acid to 5 Cc. of a 2-per-cent. solution of Cocaine Hydrochlorate, a yellow precipitate is produced which redissolves on shaking; on now adding 1 Cc. of hydrochloric acid, a permanent, orange-yellow precipitate will be formed.

If a small quantity of the salt be rubbed, with a glass rod, on a dry, white porcelain surface, with an equal bulk of mercurous chloride, and the mixture then breathed upon, it will acquire a dark gray or grayish-black color.

The aqueous solution of the salt yields, with silver nitrate T.S., a white precipitate insoluble in nitric acid.

The addition of sulphuric or nitric acid to the salt, at the ordinary temperature, should develop no color.

If 1 drop of a mixture of 1 volume of decinormal potassium permanganate V.S. and 2 volumes of water be added to 5 Cc. of a 2-per-cent. solution of Cocaine Hydrochlorate mixed with 3 drops of diluted sulphuric acid and contained in a small, clean, glass-stoppered vial, the pink tint produced by the permanganate should not entirely disappear within half an hour (absence of *cinnamyl-cocaine* and some other bases derived from Coca).

COCCUS.

COCHINEAL.

The dried female of *Coccus cacti* Linné (class *Insecta*; order *Hemiptera*).

About 5 Mm. long; of a purplish-gray or purplish-black color; somewhat oblong and angular in outline; flat or concave beneath; convex above; transversely wrinkled; easily pulverizable, yielding a dark red powder. Odor faint; taste slightly bitterish.

Cochineal contains a red coloring matter soluble in water, alcohol, or water of ammonia, slightly soluble in ether, insoluble in fixed and volatile oils.

On macerating Cochineal in water, it swells up, but no insoluble powder should be separated.

When completely incinerated, Cochineal should leave not more than 5 per cent. of ash.

CODEINA.

CODEINE.



An alkaloid obtained from Opium.

White, or nearly translucent, orthorhombic prisms, or octohedral crystals, odorless, having a faintly bitter taste, and slightly efflorescent in warm air.

Soluble, at 15° C. (59° F.), in 80 parts of water, and in 3 parts of alcohol. In boiling water Codeine melts into oily drops which dissolve in 17 parts of the water. It is very soluble in boiling alcohol; also soluble in 30 parts of ether, and in 2 parts of chloroform.

At 100° C. (212° F.) Codeine loses its water of crystallization (5.67 per cent.); at 155° C. (311° F.) it melts, forming a colorless liquid; and, when ignited, it is consumed without leaving a residue.

Codeine is alkaline to litmus paper.

If 0.1 Gm. of Codeine be dissolved in 6 Cc. of cold, concentrated sulphuric acid (free from nitrose), the resulting liquid should be colorless.

If about 2 Cc. of this solution be poured into a small porcelain capsule, and 1 drop of highly diluted nitric acid (made by adding 1 drop of nitric acid to 200 Cc. of water) added, a bluish-red tint gradually changing to pale blue will be developed.

Another portion of the same solution, of about 2 Cc., gently warmed, and mixed with 1 drop of a mixture of 1 volume of ferric chloride T.S. and 19 volumes of water, likewise assumes a bluish or blue tint (difference from *morphine*).

On adding to 5 Cc. of an aqueous solution of Codeine (1 in 100) 10 drops of bromine water, and shaking so as to redissolve the precipitate formed, the liquid will gradually develop a light claret-red tint. This tint may be developed at once by the addition of ammonia water.

On sprinkling 0.05 Gm. of Codeine upon 2 Cc. of nitric acid (specific gravity 1.200), the crystals will turn red, but the acid, even when warmed, will acquire only a yellow color (difference from and absence of *morphine*).

COLCHICI RADIX.

COLCHICUM ROOT.

The corm of *Colchicum autumnale* Linné (nat. ord. *Liliaceæ*).

About 25 Mm. long, ovoid, flattish and with a groove on one side; externally brownish and wrinkled; internally white and solid; often in transverse slices,

reniform in shape, and breaking with a short, mealy fracture; inodorous; taste sweetish, bitter, and somewhat acrid.

Preparations: Extractum Colchici Radicis. Extractum Colchici Radicis Fluidum. Vinum Colchici Radicis.

COLCHICI SEMEN.

COLCHICUM SEED.

The seed of *Colchicum autumnale* Linné (nat. ord. *Liliaceæ*).

Subglobular, about 2 Mm. thick, very slightly pointed at the hilum; reddish-brown, finely pitted, internally whitish; very hard and tough; inodorous; taste bitter and somewhat acrid.

Preparations: Extractum Colchici Seminis Fluidum. Tinctura Colchici Seminis. Vinum Colchici Seminis.

COLLODIUM.

COLLODION.

- Pyroxylin, *thirty grammes* 30 Gm.
- Ether, *seven hundred and fifty cubic centimeters* 750 Cc.
- Alcohol, *two hundred and fifty cubic centimeters* 250 Cc.

To the Pyroxylin, contained in a suitable bottle, add the Ether, and let it stand for fifteen minutes; then add the Alcohol, and shake the bottle until the Pyroxylin is dissolved. Cork the bottle well, and set it aside until the liquid has become clear. Then decant the clear portion from any sediment which may have formed, and transfer it to bottles, which should be well corked.

Keep the Collodion in cork-stoppered bottles, in a cool place, remote from lights or fire.

Preparations: Collodium Flexile. Collodium Stypticum.

COLLODIUM CANTHARIDATUM.

CANTHARIDAL COLLODION.

[BLISTERING COLLODION.]

- Cantharides, in No. 60 powder, *sixty grammes* 60 Gm.
- Flexible Collodion, *eighty-five grammes* 85 Gm.
- Chloroform, *a sufficient quantity*.

To make *one hundred grammes* . . . 100 Gm.

Pack the Cantharides firmly in a cylindrical percolator, and gradually pour Chloroform upon it, until the powder is exhausted. Recover the chloroform by distillation from a water-bath, and evaporate the residue, in a capsule, on a water-bath, until it weighs *fifteen* (15) *grammes*. Dissolve this in the Flexible Collodion, and set it aside to become clear by settling. Finally pour off the clear portion from

any sediment which may have formed, and transfer it to bottles, which should be securely corked.

Keep the Cantharidal Collodion in cork-stoppered bottles, in a cool place, remote from lights or fire.

COLLODIUM FLEXILE.

FLEXIBLE COLLODION.

Collodion, <i>nine hundred and twenty grammes</i>	920 Gm.
Canada Turpentine, <i>fifty grammes</i>	50 Gm.
Castor Oil, <i>thirty grammes</i>	30 Gm.

To make *one thousand grammes*. . . . 1000 Gm.

Weigh the ingredients, successively, into a tared bottle, and mix them thoroughly.

Keep the product in cork-stoppered bottles, in a cool place, remote from lights or fire.

COLLODIUM STYPTICUM.

STYPTIC COLLODION.

Tannic Acid, <i>twenty grammes</i>	20 Gm.
Alcohol, <i>five cubic centimeters</i>	5 Cc.
Ether, <i>twenty-five cubic centimeters</i>	25 Cc.
Collodion, <i>a sufficient quantity</i> ,	

To make *one hundred cubic centimeters*. . . . 100 Cc.

Introduce the Tannic Acid, Alcohol, and Ether into a graduated bottle, agitate until the Tannic Acid is thoroughly incorporated and partially dissolved, then add enough Collodion to make up the volume to *one hundred (100) cubic centimeters*, and shake occasionally, until the Acid is completely dissolved.

Keep the product in cork-stoppered bottles, in a cool place, remote from lights or fire.

COLOCYNTHIS.

COLOCYNTH.

The fruit of *Citrullus Colocynthis* Schrader (nat. ord. *Cucurbitaceæ*), deprived of its rind.

From 5 to 10 Cm. in diameter; globular; white or yellowish-white; light, spongy; readily breaking into three wedge-shaped pieces, each containing, near the rounded surface, many flat, ovate, brown seeds; inodorous; taste intensely bitter.

The pulp only should be used, the seeds being separated and rejected.

Preparation: Extractum Colocynthisidis.

CONFECTIO ROSÆ.

CONFECTION OF ROSE.

Red Rose, in No. 60 powder, <i>eighty grammes</i>	80 Gm.
Sugar, in fine powder, <i>six hundred and forty grammes</i>	640 Gm.
Clarified Honey, <i>one hundred and twenty grammes</i>	120 Gm.
Stronger Rose Water, <i>one hundred and sixty cubic centimeters</i>	160 Cc.

Rub the Red Rose with the Stronger Rose Water previously heated to 65° C. (149° F.), then gradually add the Sugar and Honey, and beat the whole together until a uniform mass results.

CONFECTIO SENNÆ.

CONFECTION OF SENNA.

Senna, in No. 60 powder, <i>one hundred grammes</i>	100 Gm.
Cassia Fistula, bruised, <i>one hundred and sixty grammes</i> ..	160 Gm.
Tamarind, <i>one hundred grammes</i>	100 Gm.
Prune, sliced, <i>seventy grammes</i>	70 Gm.
Fig, bruised, <i>one hundred and twenty grammes</i>	120 Gm.
Sugar, in fine powder, <i>five hundred and fifty-five grammes</i>	555 Gm.
Oil of Coriander, <i>five grammes</i>	5 Gm.
Water, <i>a sufficient quantity</i> .	

To make *one thousand grammes*.... 1000 Gm.

Place the Cassia Fistula, Tamarind, Prune, and Fig in a close vessel with *five hundred* (500) *cubic centimeters* of Water, and digest for three hours, by means of a water-bath. Separate the coarser portions with the hand, and rub the pulpy mass, first through a coarse hair sieve, and then through a fine one, or through a muslin cloth. Mix the residue with *one hundred and fifty* (150) *cubic centimeters* of Water, and, having digested the mixture for a short time, treat it as before, and add the product to the pulpy mass first obtained. Then, by means of a water-bath, dissolve the Sugar in the pulpy liquid, and evaporate the whole, in a tared vessel, until it weighs *eight hundred and ninety-five* (895) *grammes*. Lastly, add the Senna and the Oil of Coriander, and incorporate them thoroughly with the other ingredients while they are yet warm.

CONIUM.

CONIUM.

[HEMLOCK.]

The full grown fruit of *Conium maculatum* Linné (nat. ord. *Umbelliferæ*), gathered while yet green.

About 3 Mm. long; broadly ovate; laterally compressed; grayish-green; often divided into the two mericarps, each with five crenate ribs, without oil-tubes, and containing a seed which is grooved on the face; odor and taste slight.

When triturated with solution of potassium or sodium hydrate, Conium gives off a strong, disagreeable, mouse-like odor.

Preparations: Extractum Conii. Extractum Conii Fluidum.

CONVALLARIA.

CONVALLARIA.

The rhizome and roots of *Convallaria majalis* Linné (nat. ord. *Liliaceæ*).

Of horizontal growth and somewhat branched, about 3 Mm. thick, cylindrical, wrinkled, whitish, marked with few circular scars; at the annulate joint with about eight or ten long, thin roots; fracture somewhat fibrous, white; odor peculiar, pleasant; taste sweetish, bitter, and somewhat acrid.

Preparation: Extractum Convallariæ Fluidum.

COPAIBA.

COPAIBA.

[BALSAM OF COPAIBA.]

The oleoresin of *Copaiba Langsdorffii* (Desfontaines) O. Kuntze, and of other species of *Copaiba* (nat. ord. *Leguminosæ*).

A transparent or translucent, more or less viscid liquid, of a pale yellow to brownish-yellow color, having a peculiar, aromatic odor, and a bitter and acrid taste.

Specific gravity: 0.940 to 0.990 at 15° C. (59° F.).

Insoluble in water; readily soluble in absolute alcohol, ether, chloroform, carbon disulphide, benzin, and fixed and volatile oils. It yields a transparent mixture with one-third of its volume of ammonia water.

When Copaiba is heated, it should not evolve the odor of *turpentine*.

When the volatile oil has been completely driven off by heating Copaiba in a flat-bottomed capsule, the residue, when cold, should be amorphous, transparent, and friable (absence of *fixed oils*).

Copaiba should not be fluorescent, and, when heated to 130° C. (266° F.), it should not become gelatinous. On adding 1 drop of Copaiba to 19 drops of carbon disulphide, and shaking the mixture with 1 drop of a cold mixture of equal parts of nitric and sulphuric acids, it should not acquire a purplish-red or violet color (absence of *gurjun balsam*).

Preparation: Massa Copaibæ.

CORIANDRUM.

CORIANDER.

The fruit of *Coriandrum sativum* Linné (nat. ord. *Umbelliferae*).

Globular; about 4 Mm. in diameter; crowned with the calyx-teeth and stylopod; brownish-yellow, with slight, longitudinal ridges; the two mericarps cohering, enclosing a lenticular cavity, and each furnished on the face with two oil-tubes; odor and taste agreeably aromatic.

CREOSOTUM.

CREOSOTE.

A mixture of phenols, chiefly guaiacol and creosol, obtained during the distillation of wood-tar, preferably of that derived from the beech, *Fagus sylvatica* Linné (nat. ord. *Cupuliferæ*).

An almost colorless, yellowish or pinkish, highly refractive, oily liquid, having a penetrating, smoky odor, and a burning, caustic taste; usually becoming darker in tint on exposure to light.

Specific gravity: not below 1.070 at 15° C. (59° F.).

Soluble in about 150 parts of water at 15° C. (59° F.), but without forming a perfectly clear solution. With 120 parts of hot water it forms a clear liquid which on cooling becomes turbid from the separation of minute oily drops. The filtrate from this yields a reddish-brown precipitate with bromine T.S. (distinction from *carbolic acid*). Soluble, in all proportions, in absolute alcohol, ether, chloroform, benzin, carbon disulphide, acetic acid, and fixed and volatile oils.

It begins to boil at about 205° C. (402.8° F.), and most of it distils over between 205° and 215° C. (401° and 419° F.). When it is cooled to -20° C. (-4° F.), it becomes gelatinous, but does not solidify (difference from *carbolic acid*). It is inflammable, burning with a luminous, smoky flame.

Creosote is neutral, or only faintly acid to litmus paper.

On mixing equal volumes of Creosote and collodion in a dry test-tube, no coagulum should form.

If 1 volume of Creosote be mixed with 1 volume of glycerin, a nearly clear mixture will result from which the Creosote will separate on the addition of 1 or more volumes of water.

On adding to 10 Cc. of a saturated, aqueous solution of Creosote 1 drop of ferric chloride T.S., the liquid will acquire a violet-blue tint which rapidly changes to greenish and brown, with formation, usually, of a brown precipitate. (The preceding three tests show difference from and absence of notable quantities of *carbolic acid*).

On mixing 2 Cc. of Creosote with 8 Cc. of a 7.5-per-cent. solution of sodium hydrate, a clear, pale yellowish liquid results which becomes turbid when diluted with water, but clears up after 50 Cc. have been added (absence of *neutral oils*).

If 1 Cc. of Creosote be mixed with a warm, 20-per-cent. solution of potassium hydrate in absolute alcohol, a solid crystalline mass will form upon cooling.

If 1 Cc. of Creosote be shaken with 2 Cc. of benzin and 2 Cc. of freshly prepared barium hydrate T.S., upon separating, the benzin should not be blue or muddy, and the aqueous layer should not have a red tint (absence of *cærulignol* and some other high-boiling constituents of wood-tar).

Preparation: Aqua Creosoti.

CRETA PRÆPARATA.

PREPARED CHALK.



A white, amorphous powder, often moulded into conical drops, odorless and tasteless; permanent in the air.

Almost insoluble in water; insoluble in alcohol. Soluble in diluted acetic, hydrochloric, or nitric acid with copious effervescence, but without leaving more than a trifling residue.

When heated to redness, Prepared Chalk loses carbon dioxide and is converted into lime.

The solution in diluted acetic acid yields, with ammonium oxalate T.S., a white precipitate insoluble in acetic, but soluble in hydrochloric acid.

If from the solution in diluted acetic acid the calcium be completely removed by precipitation with ammonium oxalate T.S. in slight excess, the filtrate should not be rendered very turbid upon addition of sodium phosphate T.S. and a little ammonia water (limit of *magnesium*).

Another portion of the solution in acetic acid should not assume more than a slight bluish tint upon addition of potassium ferrocyanide T.S. (limit of *iron*).

Another portion of the same solution should not be rendered turbid by the addition of barium chloride T.S. (absence of *sulphate*).

In another portion of the solution no precipitate should occur upon the addition of potassium dichromate T.S. (absence of *barium*).

Preparations: Hydrargyrum cum Creta. Pulvis Cretæ Compositus. Trochisci Cretæ.

CROCUS.

SAFFRON.

The stigmas of *Crocus sativus* Linné (nat. ord. *Iridææ*).

Separate stigmas, or three, attached to the top of the style, about 3 Cm. long, flattish-tubular, almost thread-like, broader and notched above; orange-brown; odor strong, peculiar, aromatic; taste bitterish and aromatic.

Saffron should not include the yellow styles. When pressed between filtering paper, it should not leave an oily stain. When chewed it tinges the saliva deep orange-yellow.

When soaked in water, it should not deposit any pulverulent, mineral matter, nor show the presence of organic substances differing in shape from that described.

On agitating 1 part of Saffron with 100,000 parts of water, the liquid will acquire a distinct yellow color. No color is imparted to benzin agitated with Saffron (absence of *picric acid* and some *other coal-tar colors*).

On drying Saffron at 100° C. (212° F.), it should not lose more than 14 per cent. of its weight (absence of *added water*).

When thus dried, and ignited with free access of air, 100 parts of the dry Saffron should not leave more than 7.5 per cent. of ash (absence of *foreign inorganic substances*).

Preparation: Tinctura Croci.

CUBEBA.

CUBEB.

The unripe fruit of *Piper Cubeba* Linné filius (nat. ord. *Piperaceæ*).

Globular, about 4 or 5 Mm. in diameter, contracted at the base into a rounded stipe about 6 or 8 Mm. long, reticulately wrinkled, blackish-gray, internally whitish and hollow; odor strong, spicy; taste aromatic and pungent.

Cubeb should not be mixed with the nearly inodorous rachis or stalks.

Preparations: Extractum Cubebæ Fluidum. Oleoresina Cubebæ. Tinctura Cubebæ.

CUPRI SULPHAS.

COPPER SULPHATE.



[CUPRIC SULPHATE.]

Large, transparent, deep blue, triclinic crystals, odorless, of a nauseous, metallic taste; slowly efflorescent in dry air.

Soluble, at 15° C. (59° F.), in about 2.6 parts of water, and in 0.5 part of boiling water; almost insoluble in alcohol.

When carefully and continuously heated to 30° C. (86° F.), the salt loses 2 of its 5 molecules of water (14.43 per cent.), and is converted into a pale blue, amorphous powder. Two more molecules of water are lost at 100° C. (212° F.), while the fifth is retained until 200° C. (392° F.) is reached, when a white, anhydrous powder remains (63.9 per cent. of the original weight). At a still higher temperature sulphur dioxide and oxygen are given off, and a residue of black cupric oxide is left.

The aqueous solution (1 in 20) has a blue color and shows an acid reaction with litmus paper.

If a drop of the solution be placed upon a bright piece of iron, it will produce a red stain of metallic copper.

With potassium ferrocyanide T.S. the solution yields a deep reddish-brown precipitate.

Barium chloride T.S. produces a white precipitate, insoluble in hydrochloric acid.

If ammonia water be added to the solution, drop by drop, a pale blue precipitate of cupric hydrate is formed, which redissolves in an excess of ammonia water, forming a deep azure-blue solution, leaving no trace of residue undissolved (absence of *iron*, *aluminum*, etc.).

If the aqueous solution (1 in 20) be heated to boiling with an excess of sodium hydrate T.S., until all of the copper has been converted into black cupric oxide, it will yield a filtrate which, after acidulation with acetic acid, should not be colored or rendered turbid by an equal volume of hydrogen sulphide T.S. (absence of *arsenic*, *lead*, *zinc*, etc.).

If hydrogen sulphide gas be passed through 10 Cc. of the solution slightly acidulated with hydrochloric acid, until all of the copper is precipitated as sulphide, the filtrate should, on evaporation, leave not more than a trace of residue (limit of *iron*, *aluminum*, *alkaline earths*, etc.).

CUSO.

KOUSO.

[BRAYERA, PHARM. 1880.]

The female inflorescence of *Hagenia abyssinica* (Bruce) Gmelin (nat. ord. *Rosaceæ*).

In bundles, rolls, or compressed clusters, consisting of panicles about 25 Cm. long, with a sheathing bract at the base of each branch; the two roundish bracts at the base of each flower, and the four or five obovate, outer sepals are of a reddish color, membranous and veiny; calyx top-shaped, hairy, enclosing two carpels or nutlets; odor slight, fragrant and tea-like; taste bitter, acrid, and nauseous.

Preparation: Extractum Cusso Fluidum.

CYPRIPEDIUM.

CYPRIPEDIUM.

[LADIES' SLIPPER.]

The rhizome and roots of *Cypripedium pubescens* Swartz, and of *Cypripedium parviflorum* Salisbury (nat. ord. *Orchidæ*).

Of horizontal growth, bent, 10 Cm., or less, long; from 3 to 5 Mm. thick; on the upper side beset with numerous circular, cup-shaped scars; closely covered below with simple, wiry roots varying from 10 to 15 Cm. in length; brittle, dark brown, or orange-brown; fracture short, white; odor peculiar, heavy; taste sweetish, bitter, and somewhat pungent.

Preparation: Extractum Cypripedii Fluidum.

DECOCTA.

DECOCTIONS.

An ordinary Decoction, the strength of which is not directed by the physician, nor specified by the Pharmacopœia, shall be prepared by the following formula:

Take of

The Substance, coarsely comminuted, *fifty grammes* . . . 50 Gm.

Water, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Put the substance into a suitable vessel provided with a cover, pour upon it *one thousand* (1000) *cubic centimeters* of cold Water, cover it well, and boil for fifteen minutes. Then let it cool to about 40° C. (104° F.), express, strain the expressed liquid, and pass enough cold Water through the strainer to make the product measure *one thousand* (1000) *cubic centimeters*.

Caution.—The strength of Decoctions of energetic or powerful substances should be specially prescribed by the physician.

DECOCTUM CETRARIÆ.

DECOCTION OF CETRARIA.

Cetraria, *fifty grammes* 50 Gm.

Water, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Cover the Cetraria, in a suitable vessel, with *four hundred* (400) *cubic centimeters* of cold Water, express after half an hour, and throw the liquid away. Then boil the Cetraria with *one thousand* (1000) *cubic*

centimeters of Water for half an hour, strain, and add enough cold Water, through the strainer, to make the product, when cold, measure *one thousand* (1000) *cubic centimeters*.

DECOCTUM SARSAPARILLÆ COMPOSITUM.

COMPOUND DECOCTION OF SARSAPARILLA.

Sarsaparilla, cut and bruised, <i>one hundred grammes</i>	100 Gm.
Sassafras, in No. 20 powder, <i>twenty grammes</i>	20 Gm.
Guaiacum Wood, rasped, <i>twenty grammes</i>	20 Gm.
Glycyrrhiza, bruised, <i>twenty grammes</i>	20 Gm.
Mezereum, cut and bruised, <i>ten grammes</i>	10 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Boil the Sarsaparilla and Guaiacum Wood for half an hour in a suitable vessel with *one thousand* (1000) *cubic centimeters* of Water. Then add the Sassafras, Glycyrrhiza, and Mezereum, cover the vessel well, and macerate for two hours. Finally strain, and add enough cold Water, through the strainer, to make the product measure *one thousand* (1000) *cubic centimeters*.

DIGITALIS.

DIGITALIS.

[FOXGLOVE.]

The leaves of *Digitalis purpurea* Linné (nat. ord. *Scrophularineæ*), collected from plants of the second year's growth.

From 10 to 30 Cm. long; ovate or ovate-oblong, narrowed into a petiole; crenate; dull green, densely and finely pubescent; wrinkled above; paler and reticulate beneath; midrib near the base broad; odor slight, somewhat tea-like; taste bitter, nauseous.

An infusion prepared with 1 part of Digitalis and 10 parts of boiling water, and allowed to cool, has a peculiar odor, turns blue litmus paper red, and, upon the addition of a few drops of ferric chloride T.S., acquires a darker tint, a brown precipitate appearing after a few hours.

The infusion, diluted with 3 parts of water, becomes turbid on the addition of a few drops of tannic acid T.S.

Preparations: Extractum Digitalis. Extractum Digitalis Fluidum. Infusum Digitalis. Tinctura Digitalis.

DULCAMARA.

DULCAMARA.

[BITTERSWEET.]

The young branches of *Solanum Dulcamara* Linné (nat. ord. *Solanaceæ*).

About 5 Mm., or less, thick, cylindrical, somewhat angular, longitudinally striate, more or less warty, usually hollow in the center, cut into short sections. The thin bark is externally pale greenish, or light greenish-brown, marked with alternate leaf-scars, and internally green; the greenish or yellowish wood forms one or two concentric rings. Odor slight; taste bitter, afterwards sweet.

Preparation: Extractum Dulcamaræ Fluidum.

ELASTICA.

INDIA-RUBBER.

[CAOUTCHOUC.]

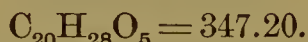
The prepared milk-juice of various species of *Hevea* (nat. ord. *Euphorbiaceæ*), known in commerce as Para Rubber.

In cakes, balls, or hollow, bottle-shaped pieces, externally brown to brownish-black, internally brownish or of lighter tint; very elastic; insoluble in water, diluted acids, or diluted solutions of alkalies; soluble in chloroform, carbon disulphide, oil of turpentine, benzin, and benzol. When heated to about 125° C. (257° F.) it melts, remaining soft and adhesive after cooling. Odor faint, peculiar; nearly tasteless.

When pure, or nearly pure, India-Rubber floats on water.

ELATERINUM.

ELATERIN.



A neutral principle obtained from Elaterium, a substance deposited by the juice of the fruit of *Ecballium Elaterium* (Linné) A. Richard (nat. ord. *Cucurbitaceæ*).

Minute, white, hexagonal scales, or prismatic crystals, without odor, and having a slightly acrid, bitter taste; permanent in the air.

Soluble, at 15° C. (59° F.), in 4250 parts of water, and in 337 parts of alcohol; in 1820 parts of boiling water, and in 34 parts of boiling alcohol; also soluble in 543 parts of ether, or in 2.4 parts of chloroform.

At 190° C. (374° F.) the crystals begin to agglutinate, and at about 209° C. (408.2° F.) they melt, forming a yellowish-brown liquid. When ignited, they are consumed without leaving a residue.

Elaterin is neutral to litmus paper.

Elaterin is dissolved by solutions of the alkalies, and reprecipitated on supersaturating with an acid.

When dissolved in cold, concentrated sulphuric acid, it causes the latter to become yellow at first, which color gradually changes to scarlet.

On dissolving some crystals of Elaterin in melted carbolic acid, and then adding a few drops of strong sulphuric acid, a crimson color will be developed which soon becomes scarlet.

An alcoholic solution of Elaterin should not be precipitated by tannic acid T.S., mercuric chloride T.S., or platinic chloride T.S. (absence of, and difference from, *alkaloids*).

Preparation: Trituratio Elaterini.

ELIXIR AROMATICUM.

AROMATIC ELIXIR.

Compound Spirit of Orange, <i>twelve cubic centimeters</i> ..	12 Cc.
Syrup, <i>three hundred and seventy-five cubic centimeters</i>	375 Cc.
Precipitated Calcium Phosphate, <i>fifteen grammes</i>	15 Gm.
Deodorized Alcohol,	
Distilled Water, each, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

To the Compound Spirit of Orange add enough Deodorized Alcohol to make *two hundred and fifty (250) cubic centimeters*. To this solution add the Syrup in several portions, agitating after each addition, and afterwards add, in the same manner, *three hundred and seventy-five (375) cubic centimeters* of Distilled Water. Mix the Precipitated Calcium Phosphate intimately with the liquid, and then filter through a wetted filter, returning the first portions of the filtrate until a transparent liquid is obtained. Lastly, wash the filter with a mixture of *one (1) volume* of Deodorized Alcohol and *three (3) volumes* of Distilled Water, until the product measures *one thousand (1000) cubic centimeters*.

ELIXIR PHOSPHORI.

ELIXIR OF PHOSPHORUS.

Spirit of Phosphorus, <i>two hundred and ten cubic centimeters</i>	210 Cc.
Oil of Anise, <i>two cubic centimeters</i>	2 Cc.
Glycerin, <i>five hundred and fifty cubic centimeters</i>	550 Cc.
Aromatic Elixir, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

To the Spirit of Phosphorus, contained in a graduated bottle, add the Oil of Anise and Glycerin, and mix them by repeatedly inverting the bottle, until they form a clear liquid. Then add Aromatic Elixir, in several portions, gently agitating after each addition, until a transparent liquid is obtained, and the product measures *one thousand (1000) cubic centimeters*. Keep the product in dark amber-colored, well-stoppered bottles, in a cool and dark place.

Each cubic centimeter of Elixir of Phosphorus represents about *one-fourth milligramme* (0.00025 Gm.) of phosphorus.

EMPLASTRUM AMMONIACI CUM HYDRARGYRO.

AMMONIAC PLASTER WITH MERCURY.

Ammoniac, <i>seven hundred and twenty grammes</i>	720 Gm.
Mercury, <i>one hundred and eighty grammes</i>	180 Gm.
Oleate of Mercury, <i>eight grammes</i>	8 Gm.
Diluted Acetic Acid, <i>one thousand cubic centimeters</i>	1000 Cc.
Lead Plaster, <i>a sufficient quantity</i> ,	

To make *one thousand grammes* 1000 Gm.

Digest the Ammoniac with the Diluted Acetic Acid, in a suitable vessel, avoiding contact with metals, until it is entirely emulsified; then strain, and evaporate the strained liquid by means of a water-bath, stirring constantly, until a small portion, taken from the vessel, hardens on cooling. Triturate the Oleate of Mercury with the Mercury gradually added, until globules of the metal cease to be visible. Next add, gradually, the Ammoniac, while yet hot; and finally, having added enough Lead Plaster, previously melted by means of a water-bath, to make the mixture weigh *one thousand (1000) grammes*, mix the whole thoroughly.

EMPLASTRUM ARNICÆ.

ARNICA PLASTER.

Extract of Arnica Root, <i>three hundred and thirty grammes</i>	330 Gm.
Resin Plaster, <i>six hundred and seventy grammes</i>	670 Gm.

To make *one thousand grammes* 1000 Gm.

Add the Extract to the Plaster, previously melted by means of a water-bath, and mix them thoroughly.

EMPLASTRUM BELLADONNÆ.

BELLADONNA PLASTER.

Alcoholic Extract of Belladonna Leaves, <i>two hundred grammes</i>	200 Gm.
Resin Plaster, <i>four hundred grammes</i>	400 Gm.
Soap Plaster, <i>four hundred grammes</i>	400 Gm.

To make *one thousand grammes* 1000 Gm.

Melt the Plasters on a water-bath; then add the Extract of Belladonna Leaves, and continue the heat, stirring constantly, until a homogeneous mass results.

EMPLASTRUM CAPSICI.

CAPSICUM PLASTER.

Oleoresin of Capsicum,
Resin Plaster, each, *a sufficient quantity.*

Melt the Resin Plaster at a gentle heat, spread a thin and even layer of it upon muslin, and allow it to cool. Then, having cut off a piece of the required size, apply a thin coating of Oleoresin of Capsicum, by means of a brush, leaving a narrow, blank margin along the edges.

A space of *ten* (10) *centimeters* square should contain about *twenty-five* (25) *centigrammes* (0.25 Gm.) of Oleoresin of Capsicum.

EMPLASTRUM FERRI.

IRON PLASTER.

[STRENGTHENING PLASTER.]

Ferric Hydrate, dried at a temperature not exceeding 80° C. (176° F.), <i>ninety grammes</i>	90 Gm.
Olive Oil, <i>fifty grammes</i>	50 Gm.
Burgundy Pitch, <i>one hundred and forty grammes</i>	140 Gm.
Lead Plaster, <i>seven hundred and twenty grammes</i>	720 Gm.
To make <i>one thousand grammes</i>	1000 Gm.

Melt the Lead Plaster and Burgundy Pitch by means of a water-bath, and add the Olive Oil; then add the Ferric Hydrate, and stir constantly until the mixture thickens on cooling.

EMPLASTRUM HYDRARGYRI.

MERCURIAL PLASTER.

Mercury, <i>three hundred grammes</i>	300 Gm.
Oleate of Mercury, <i>twelve grammes</i>	12 Gm.
Lead Plaster, <i>a sufficient quantity</i> ,	
To make <i>one thousand grammes</i>	1000 Gm.

Triturate the Mercury with the Oleate of Mercury in a tared capsule until globules of metal are no longer visible. Then place the capsule on a water-bath, add enough Lead Plaster, previously melted, to make the contents weigh *one thousand* (1000) *grammes*, and mix the whole thoroughly.

EMPLASTRUM ICHTHYOCOLLÆ.

ISINGLASS PLASTER.

[COURT PLASTER.]

Isinglass, <i>ten grammes</i>	10 Gm.
Alcohol, <i>forty grammes</i>	40 Gm.
Glycerin, <i>one gramme</i>	1 Gm.
Water,	
Tincture of Benzoin, each, <i>a sufficient quantity</i> .	

Dissolve the Isinglass in a sufficient quantity of hot Water to make the solution weigh *one hundred and twenty* (120) *grammes*. Spread one-half of this, in successive layers, upon taffeta (stretched on a frame), by means of a brush, waiting after each application until the layer is dry. Mix the second half of the Isinglass solution with the Alcohol and Glycerin, and apply it in the same manner. Then reverse the taffeta, coat it on the back with Tincture of Benzoin, and allow it to become perfectly dry.

Cut the plaster in pieces of suitable length and preserve them in well-closed vessels.

The above-directed quantities are sufficient to cover a piece of taffeta *thirty-eight* (38) *centimeters* square.

EMPLASTRUM OPII.

OPIUM PLASTER.

Extract of Opium, <i>sixty grammes</i>	60 Gm.
Burgundy Pitch, <i>one hundred and eighty grammes</i>	180 Gm.
Lead Plaster, <i>seven hundred and sixty grammes</i>	760 Gm.
Water, <i>eighty cubic centimeters</i>	80 Cc.

To make *one thousand grammes*.... 1000 Gm.

Rub the Extract of Opium with the Water, until it is uniformly soft, and add it to the Burgundy Pitch and Lead Plaster melted together by means of a water-bath; then continue the heat for a short time, stirring constantly, until the moisture is evaporated.

EMPLASTRUM PICIS BURGUNDICÆ.

BURGUNDY PITCH PLASTER.

Burgundy Pitch, <i>eight hundred grammes</i>	800 Gm.
Olive Oil, <i>fifty grammes</i>	50 Gm.
Yellow Wax, <i>one hundred and fifty grammes</i>	150 Gm.

To make *one thousand grammes*.... 1000 Gm.

Melt together the Burgundy Pitch and Yellow Wax, then incorporate the Olive Oil, and stir constantly, until the mass thickens on cooling.

EMPLASTRUM PICIS CANTHARIDATUM.

CANTHARIDAL PITCH PLASTER.

[WARMING PLASTER.]

Cerate of Cantharides, <i>eighty grammes</i>	80 Gm.
Burgundy Pitch, <i>a sufficient quantity</i> ,	

To make <i>one thousand grammes</i>	1000 Gm.
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Melt the Cerate of Cantharides on a water-bath containing boiling water, and continue the heat for fifteen minutes; then strain it through a piece of muslin of close texture so that the Cantharides will be retained on the muslin. To the strained liquid add a sufficient quantity of Burgundy Pitch to make the whole weigh *one thousand* (1000) *grammes*, render the mixture homogeneous by stirring, remove the heat, and stir the mass until it thickens on cooling.

EMPLASTRUM PLUMBI.

LEAD PLASTER.

[DIACHYLON PLASTER.]

Lead Oxide, <i>three thousand two hundred grammes</i>	3200 Gm.
Olive Oil, <i>six thousand grammes</i>	6000 Gm.
Water, <i>a sufficient quantity</i> .	

Mix the Lead Oxide, previously passed through a No. 80 sieve, intimately with about one-half of the Olive Oil, by trituration, and add the mixture to the remainder of the Oil contained in a bright copper boiler of a capacity equal to at least four times the bulk of the ingredients. Then add *one thousand* (1000) *cubic centimeters* of boiling Water, and boil the whole together, over a fire, constantly stirring with a wooden spatula, until a small portion, when dropped into cold water, is found to be pliable and tenacious. From time to time add a little Water to replace that lost by evaporation. When the contents of the boiler have acquired a whitish color and are perfectly homogeneous, transfer them to a vessel containing warm Water, and as soon as the mass has sufficiently cooled, knead it well with the Water so as to remove the glycerin, renewing the Water from time to time, as long as it may be necessary. Finally divide the mass into rolls of suitable size.

A yellowish-white, pliable, and tenacious, but not greasy mass, gradually acquiring a brownish tint on the outside.

On treating 5 Gm. of Lead Plaster with 25 Cc. of benzol, a somewhat viscid and slightly turbid solution will result, which will separate into a clear and a gelatinous layer after some time, but which should not deposit any sediment (absence of *uncombined lead oxide*).

Preparations: Emplastrum Resinæ. Emplastrum Saponis. Unguentum Diachylon.

EMPLASTRUM RESINÆ.

RESIN PLASTER.

[ADHESIVE PLASTER.]

Resin, in fine powder, <i>one hundred and forty grammes</i>	140 Gm.
Lead Plaster, <i>eight hundred grammes</i>	800 Gm.
Yellow Wax, <i>sixty grammes</i>	60 Gm.
<hr/>	
To make <i>one thousand grammes</i>	1000 Gm.

Melt the Lead Plaster and Yellow Wax together with a gentle heat; then add the Resin, and, when it is melted, mix the mass thoroughly.

EMPLASTRUM SAPONIS.

SOAP PLASTER.

Soap, dried and in coarse powder, <i>one hundred grammes</i> ..	100 Gm.
Lead Plaster, <i>nine hundred grammes</i>	900 Gm.
Water, <i>a sufficient quantity</i> .	

Rub the Soap with enough Water to reduce it to a semi-liquid state; then mix it with the Lead Plaster, previously melted, and evaporate to the proper consistence.

EMULSUM AMMONIACI.

EMULSION OF AMMONIAC.

[MISTURA AMMONIACI, PHARM. 1880.]

Ammoniac, <i>forty grammes</i>	40 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Rub the Ammoniac, in a warmed mortar, with *nine hundred (900) cubic centimeters* of Water, at first very gradually added, until a uniform emulsion results. Then strain the mixture into a graduated vessel, and wash the mortar and strainer with enough Water to make the product measure *one thousand (1000) cubic centimeters*.

EMULSUM AMYGDALÆ.

EMULSION OF ALMOND.

[MISTURA AMYGDALÆ, PHARM. 1880. MILK OF ALMOND.]

Sweet Almond, <i>sixty grammes</i>	60 Gm.
Acacia, in fine powder, <i>ten grammes</i>	10 Gm.
Sugar, <i>thirty grammes</i>	30 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* 1000 Cc.

Having blanched the Almond, add the Acacia and Sugar, and beat them, in a mortar, until they are thoroughly mixed. Then rub the mass with *nine hundred (900) cubic centimeters* of Water, at first very gradually added, until a uniform mixture results. Strain this into a graduated vessel, and wash the mortar and strainer with enough Water to make the product measure *one thousand (1000) cubic centimeters*. Mix the whole thoroughly.

EMULSUM ASAFÆTIDÆ.

EMULSION OF ASAFETIDA.

[MISTURA ASAFÆTIDÆ, PHARM. 1880. MILK OF ASAFÆTIDA.]

Asafetida, in selected tears, <i>forty grammes</i>	40 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* 1000 Cc.

Rub the Asafetida, in a warmed mortar, with *nine hundred (900) cubic centimeters* of Water, at first very gradually added, until a uniform emulsion results. Then strain the mixture into a graduated vessel, and wash the mortar and strainer with enough Water to make the product measure *one thousand (1000) cubic centimeters*. Mix the whole thoroughly.

EMULSUM CHLOROFORMI.

EMULSION OF CHLOROFORM.

[MISTURA CHLOROFORMI, PHARM. 1880.]

Chloroform, <i>forty cubic centimeters</i>	40 Cc.
Expressed Oil of Almond, <i>sixty cubic centimeters</i>	60 Cc.
Tragacanth, in very fine powder, <i>fifteen grammes</i>	15 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* 1000 Cc.

Introduce the Tragacanth into a perfectly dry bottle of sufficient capacity, add the Chloroform, and shake the bottle thoroughly, so that every part of the surface may become wetted. Then add about *two hundred and fifty* (250) *cubic centimeters* of Water, and incorporate it by vigorous shaking. Next add the Expressed Oil of Almond, in several portions, shaking after each addition, and when the Oil has been thoroughly emulsified, add enough Water, in divided portions, shaking after each addition, until the product measures *one thousand* (1000) *cubic centimeters*.

ERGOTA.

ERGOT.

[ERGOT OF RYE.]

The sclerotium of *Claviceps purpurea* (Fries) Tulasne (class *Fungi*), replacing the grain of rye, *Secale cereale* Linné (nat. ord. *Gramineæ*).

Ergot should be only moderately dried. It should be preserved in a close vessel, and a few drops of chloroform should be dropped upon it from time to time to prevent the development of insects.

When more than one year old, it is unfit for use.

Somewhat fusiform, obtusely triangular, usually curved, about 2 or 3 Cm. long, and 3 Mm. thick; three-furrowed, obtuse at both ends, purplish-black, internally whitish with some purplish striæ, breaking with a short fracture; odor peculiar, heavy, increased by trituration with potassium or sodium hydrate T.S.; taste oily and disagreeable.

Old Ergot, which breaks with a sharp snap, is almost or entirely devoid of a pinkish tinge upon the fracture, is hard and brittle between the teeth, and is comparatively odorless and tasteless, should be rejected.

Preparations: Extractum Ergotæ Fluidum. Vinum Ergotæ.

ERIODICTYON.

ERIODICTYON.

The leaves of *Eriodictyon glutinosum* Bentham (nat. ord. *Hydrophyllaceæ*).

* Oblong-lanceolate, 5 to 10 Cm. long, acute at the apex, and below narrowed into a short petiole, the margin sinuately toothed to nearly entire; upper surface green, smooth, and covered with a brownish resin; lower surface reticulate and minutely white-tomentose; odor somewhat aromatic; taste balsamic and sweetish.

Preparation: Extractum Eriodictyi Fluidum.

EUCALYPTOL.

EUCALYPTOL.



A neutral body obtained from the volatile oil of *Eucalyptus globulus* Labillardière, and of some other species of *Eucalyptus* (nat. ord. *Myrtaceæ*).

Eucalyptol should be kept in well-stoppered bottles, in a cool place, protected from light.

A colorless liquid, having a characteristic, aromatic, and distinctly camphoraceous odor, and a pungent, spicy, and cooling taste.

Specific gravity : 0.930 at 15° C. (59° F.).

Boiling point : 176° to 177° C. (348.8° to 350.6° F.).

It is optically inactive (distinction from the oil of *Eucalyptus* and many other volatile oils).

When exposed to a temperature some degrees below 0° C. (32° F.), or placed in a freezing mixture, it solidifies to a mass of colorless, needle-shaped crystals, which liquefy at -1° C. (30.2° F.).

Soluble, in all proportions, in alcohol, carbon disulphide, and glacial acetic acid.

If a portion of Eucalyptol be shaken with an equal volume of sodium hydrate T.S., it should not diminish in volume.

Its alcoholic solution should be neutral to litmus-paper, and should not assume a brownish or violet color on the addition of a drop of ferric chloride T.S. (absence of *phenols*).

EUCALYPTUS.

EUCALYPTUS.

The leaves of *Eucalyptus globulus* Labillardière (nat. ord. *Myrtaceæ*), collected from the older parts of the tree.

Petiolate, lanceolately scythe-shaped, from 15 to 30 Cm. long, rounded below, tapering above, entire, leathery, grayish-green, glandular, feather-veined between the midrib and marginal veins; odor strongly camphoraceous; taste pungently aromatic and somewhat cooling, bitter and astringent.

Preparation : Extractum Eucalypti Fluidum.

EUONYMUS.

EUONYMUS.

[WÀHOO.]

The bark of the root of *Euonymus atropurpureus* Jacquin (nat. ord. *Celastrineæ*).

In quilled or curved pieces, from 2 to 5 Mm. thick; outer surface ash-gray, with blackish patches, detached in thin and small scales; inner surface whitish or slightly tawny, smooth; fracture smooth, whitish, the inner layers of a laminated appearance; nearly inodorous; taste sweetish, somewhat bitter and acrid.

Preparation : Extractum Euonymi.

EUPATORIUM.

EUPATORIUM.

[THOROUGHWORT.]

The leaves and flowering tops of *Eupatorium perfoliatum* Linné (nat. ord. *Compositæ*).

Leaves opposite, united at the base, lanceolate, from 10 to 15 Cm. long, tapering, crenately serrate, rugosely veined, rough above, downy and resinous-dotted beneath; flower-heads corymbed, numerous, with an oblong involucre of lance-linear scales, and with from ten to fifteen white florets, having a bristly pappus in a single row; odor weak and aromatic; taste astringent and bitter.

Preparation: Extractum Eupatorii Fluidum.

EXTRACTUM ACONITI.

EXTRACT OF ACONITE.

Aconite, in No. 60 powder, *one thousand grammes* 1000 Gm.
Alcohol, *a sufficient quantity*.

Moisten the powder with *four hundred* (400) *cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until *three thousand* (3000) *cubic centimeters* of tincture are obtained, or the Aconite is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, evaporate the remainder in a porcelain capsule, at a temperature not exceeding 50° C. (122° F.), to *one hundred* (100) *cubic centimeters*, add the reserved portion, and evaporate, at or below the above-mentioned temperature, until an extract of a pilular consistence remains.

EXTRACTUM ACONITI FLUIDUM.

FLUID EXTRACT OF ACONITE.

Aconite, in No. 60 powder, *one thousand grammes* 1000 Gm.
Alcohol,
Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. 1000 Cc.

Mix *seven hundred and fifty* (750) *cubic centimeters* of Alcohol with *two hundred and fifty* (250) *cubic centimeters* of Water, and, having moistened

the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Aconite is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, in a porcelain capsule, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM ALOES.

EXTRACT OF ALOES.

Socotrine Aloes, *one hundred grammes* 100 Gm.
Boiling Distilled Water, *one thousand cubic centimeters* . . 1000 Cc.

Mix the Aloes with the Water in a suitable vessel, stirring constantly, until the particles of Aloes are thoroughly disintegrated, and let the mixture stand for twelve hours; then pour off the clear liquor, strain the residue, mix the liquids, and evaporate to dryness by means of a water- or steam-bath.

EXTRACTUM APOCYNII FLUIDUM.

FLUID EXTRACT OF APOCYNUM.

Apocynum, in No. 60 powder, *one thousand grammes* . . . 1000 Gm.
Glycerin, *one hundred cubic centimeters* 100 Cc.
Alcohol,
Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix the Glycerin with *six hundred and fifty* (650) *cubic centimeters* of Alcohol and *two hundred and fifty* (250) *cubic centimeters* of Water, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and afterwards a

mixture of Alcohol and Water, made in the proportion of *six hundred and fifty* (650) *cubic centimeters* of Alcohol to *three hundred and fifty* (350) *cubic centimeters* of Water, until the Apocynum is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM ARNICÆ RADICIS.

EXTRACT OF ARNICA ROOT.

Arnica Root, in No. 60 powder, *one thousand grammes* . . 1000 Gm.
Diluted Alcohol, *a sufficient quantity*.

Moisten the powder with *four hundred* (400) *cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for twenty-four hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Arnica Root is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate; evaporate the remainder to *one hundred* (100) *cubic centimeters*, at a temperature not exceeding 50° C. (122° F.), mix the residue with the reserved portion, and evaporate, at or below the above-mentioned temperature, to a pilular consistence.

Preparation: Emplastrum Arnicæ.

EXTRACTUM ARNICÆ RADICIS FLUIDUM.

FLUID EXTRACT OF ARNICA ROOT.

Arnica Root, in No. 60 powder, *one thousand grammes* . . 1000 Gm.
Alcohol,
Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix *seven hundred and fifty* (750) *cubic centimeters* of Alcohol with *two hundred and fifty* (250) *cubic centimeters* of Water, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight

hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Arnica Root is exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM AROMATICUM FLUIDUM.

AROMATIC FLUID EXTRACT.

Aromatic Powder, *one thousand grammes* 1000 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Moisten the powder with *three hundred and fifty (350) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Aromatic Powder is exhausted. Reserve the first *eight hundred and fifty (850) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM ASCLEPIADIS FLUIDUM.

FLUID EXTRACT OF ASCLEPIAS.

Asclepias, in No. 60 powder, *one thousand grammes* 1000 Gm.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Moisten the powder with *four hundred (400) cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Asclepias is exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM ASPIDOSPERMATIS FLUIDUM.**FLUID EXTRACT OF ASPIDOSPERMA.**

Aspidosperma, in No. 60 powder, *one thousand grammes* 1000 Gm.

Glycerin, *one hundred cubic centimeters* 100 Cc.

Alcohol,

Water, each, *a sufficient quantity,*

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix the Glycerin with *six hundred (600) cubic centimeters* of Alcohol and *three hundred (300) cubic centimeters* of Water, and, having moistened the powder with *four hundred (400) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and then a mixture of Alcohol and Water, made in the proportion of *two hundred (200) cubic centimeters* of Alcohol to *one hundred (100) cubic centimeters* of Water, until the Aspidosperma is exhausted. Reserve the first *eight hundred (800) cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM AURANTII AMARI FLUIDUM.**FLUID EXTRACT OF BITTER ORANGE PEEL.**

Bitter Orange Peel, in No. 40 powder, *one thousand*

grammes. 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity,*

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix *six hundred (600) cubic centimeters* of Alcohol with *three hundred (300) cubic centimeters* of Water, and, having moistened the powder with *three hundred and fifty (350) cubic centimeters* of the mixture, pack it moderately in a conical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using

the same proportions of Alcohol and Water as before, until the Orange Peel is exhausted. Reserve the first *eight hundred (800) cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM BELLADONNÆ FOLIORUM ALCOHOLICUM.

ALCOHOLIC EXTRACT OF BELLADONNA LEAVES.

[EXTRACTUM BELLADONNÆ ALCOHOLICUM, PHARM. 1880.]

Belladonna Leaves, in No. 60 powder, *one thousand grammes*..... 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*.

Mix *two thousand (2000) cubic centimeters* of Alcohol with *one thousand (1000) cubic centimeters* of Water, and, having moistened the powder with *four hundred (400) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until *three thousand (3000) cubic centimeters* of tincture are obtained, or the Belladonna Leaves are exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate, evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to *one hundred (100) cubic centimeters*, mix the residue with the reserved portion, and evaporate at or below the above-mentioned temperature to a pilular consistence.

Preparations: Emplastrum Belladonnæ. Unguentum Belladonnæ.

EXTRACTUM BELLADONNÆ RADICIS FLUIDUM.

FLUID EXTRACT OF BELLADONNA ROOT.

[EXTRACTUM BELLADONNÆ FLUIDUM, PHARM. 1880.]

Belladonna Root, in No. 60 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix *eight hundred* (800) *cubic centimeters* of Alcohol with *two hundred* (200) *cubic centimeters* of Water, and, having moistened the powder with *three hundred and fifty* (350) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the *Belladonna Root* is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

Preparation: *Linimentum Belladonnæ*.

EXTRACTUM BUCHU FLUIDUM.

FLUID EXTRACT OF BUCHU.

Buchu, in No. 60 powder, *one thousand grammes* 1000 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the powder with *four hundred* (400) *cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Buchu is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM CALAMI FLUIDUM.

FLUID EXTRACT OF CALAMUS.

Calamus, in No. 60 powder, *one thousand grammes* 1000 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the powder with *three hundred and fifty* (350) *cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add

enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Calamus is exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM CALUMBÆ FLUIDUM.

FLUID EXTRACT OF CALUMBA.

Calumba, in No. 20 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Mix *seven hundred and fifty (750) cubic centimeters* of Alcohol with *two hundred and fifty (250) cubic centimeters* of Water, and, having moistened the powder with *three hundred (300) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Calumba is exhausted. Reserve the first *seven hundred (700) cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM CANNABIS INDICÆ.

EXTRACT OF INDIAN CANNABIS.

Indian Cannabis, in No. 20 powder, *one thousand grammes* 1000 Gm.

Alcohol, *a sufficient quantity*.

Moisten the powder with *three hundred (300) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower

orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Cannabis is exhausted. Distil off the Alcohol from the tincture by means of a water-bath, and evaporate the residue, in a porcelain capsule, on a water-bath, to a pilular consistence.

EXTRACTUM CANNABIS INDICÆ FLUIDUM.

FLUID EXTRACT OF INDIAN CANNABIS.

Indian Cannabis, in No. 20 powder, *one thousand grammes* 1000 Gm.
Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *three hundred (300) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Indian Cannabis is exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue, in a porcelain capsule, to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM CAPSICI FLUIDUM.

FLUID EXTRACT OF CAPSICUM.

Capsicum, in No. 60 powder, *one thousand grammes* 1000 Gm.
Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *five hundred (500) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Capsicum is exhausted. Reserve the first *nine hundred (900) cubic centi-*

meters of the percolate, and evaporate the remainder to a soft extract ; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure one thousand (1000) cubic centimeters.

EXTRACTUM CASTANÆÆ FLUIDUM.

FLUID EXTRACT OF CASTANEA.

Castanea, in No. 30 powder, *one thousand grammes* 1000 Gm.

Glycerin, *one hundred cubic centimeters* 100 Cc.

Alcohol,

Water, each, *a sufficient quantity,*

To make *one thousand cubic centimeters* 1000 Cc.

Pour *five thousand (5000) cubic centimeters* of boiling Water upon the powder, allow it to macerate for two hours, then express the liquid, transfer the residue to a percolator, and pour Water upon it until the powder is exhausted. Evaporate the united liquids, on a water-bath, to *two thousand (2000) cubic centimeters*, allow this to cool, and add *six hundred (600) cubic centimeters* of Alcohol. When the insoluble matter has subsided, separate the clear liquid, filter the remainder, evaporate the united liquids to *seven hundred (700) cubic centimeters*, allow this to cool, add the Glycerin, and enough Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM CHIMAPHILÆ FLUIDUM.

FLUID EXTRACT OF CHIMAPHILA.

Chimaphila, in No. 30 powder, *one thousand grammes* . . . 1000 Gm.

Diluted Alcohol, *a sufficient quantity,*

To make *one thousand cubic centimeters* 1000 Cc.

Moisten the powder with *four hundred (400) cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator ; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Chimaphila is exhausted. Reserve the first *seven hundred (700) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract ; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM CHIRATÆ FLUIDUM.

FLUID EXTRACT OF CHIRATA.

Chirata, in No. 30 powder, *one thousand grammes* 1000 Gm.
 Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix *six hundred (600) cubic centimeters* of Alcohol with *three hundred (300) cubic centimeters* of Water, and, having moistened the powder with *three hundred and fifty (350) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Chirata is exhausted. Reserve the first *eight hundred and fifty (850) cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM CIMICIFUGÆ.

EXTRACT OF CIMICIFUGA.

Cimicifuga, in No. 60 powder, *one thousand grammes* 1000 Gm.
 Alcohol, *a sufficient quantity*.

Moisten the powder with *two hundred and fifty (250) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Cimicifuga is exhausted. Distil off the Alcohol from the tincture by means of a water-bath, and evaporate the residue, on a water-bath, to a pilular consistence.

EXTRACTUM CIMICIFUGÆ FLUIDUM.

FLUID EXTRACT OF CIMICIFUGA.

Cimicifuga, in No. 60 powder, *one thousand grammes* 1000 Gm.
 Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *two hundred and fifty* (250) *cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the *Cimicifuga* is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM CINCHONÆ.

EXTRACT OF CINCHONA.

Cinchona, in No. 60 powder, <i>one thousand grammes</i>	1000 Gm.
Alcohol, <i>three thousand cubic centimeters</i>	3000 Cc.
Water, <i>one thousand cubic centimeters</i>	1000 Cc.
Diluted Alcohol, <i>a sufficient quantity</i> .	

Mix the Alcohol and Water, and, having moistened the powder with *three hundred and fifty* (350) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and then Diluted Alcohol, until *four thousand* (4000) *cubic centimeters* of tincture are obtained, or the Cinchona is exhausted. Distil off the Alcohol from the tincture by means of a water-bath, and evaporate the residue, on a water-bath, to a pilular consistence.

EXTRACTUM CINCHONÆ FLUIDUM.

FLUID EXTRACT OF CINCHONA.

Cinchona, in No. 60 powder, <i>one thousand grammes</i>	1000 Gm.
Glycerin, <i>two hundred cubic centimeters</i>	200 Cc.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* 1000 Cc.

Mix the Glycerin with *eight hundred* (800) *cubic centimeters* of Alcohol. Moisten the powder with *three hundred and fifty* (350) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator, and pour on

the remainder of the menstruum. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, and, when the liquid in the percolator has disappeared from the surface, gradually pour on a mixture of Alcohol and Water, made in the proportion of *eight hundred (800) cubic centimeters* of Alcohol to *two hundred (200) cubic centimeters* of Water, and continue the percolation until the Cinchona is exhausted. Reserve the first *seven hundred and fifty (750) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough of a mixture of Alcohol and Water, using the same proportions as before, to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM COCÆ FLUIDUM.

FLUID EXTRACT OF COCA.

Coca, in No. 40 powder, *one thousand grammes* 1000 Gm.
Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Moisten the powder with *four hundred and fifty (450) cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Coca is exhausted. Reserve the first *eight hundred (800) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM COLCHICI RADICIS.

EXTRACT OF COLCHICUM ROOT.

Colchicum Root, in No. 60 powder, *one thousand grammes* 1000 Gm.
Acetic Acid, *three hundred and fifty cubic centimeters* 350 Cc.
Water, *a sufficient quantity*.

Mix the Acetic Acid with *fifteen hundred (1500) cubic centimeters* of Water, and, having moistened the powder with *five hundred (500) cubic centimeters* of the mixture, pack it moderately in a cylindrical glass percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the

percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and then Water, until the Colchicum Root is exhausted. Evaporate the percolate in a porcelain vessel, by means of a water-bath, at a temperature not exceeding 80° C. (176° F.), to a pilular consistence.

EXTRACTUM COLCHICI RADICIS FLUIDUM.

FLUID EXTRACT OF COLCHICUM ROOT.

Colchicum Root, in No. 60 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix *six hundred (600) cubic centimeters* of Alcohol with *three hundred (300) cubic centimeters* of Water, and, having moistened the powder with *three hundred and fifty (350) cubic centimeters* of the mixture, pack it moderately in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Colchicum Root is exhausted. Reserve the first *eight hundred and fifty (850) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM COLCHICI SEMINIS FLUIDUM.

FLUID EXTRACT OF COLCHICUM SEED.

Colchicum Seed, in No. 30 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix *six hundred (600) cubic centimeters* of Alcohol with *three hundred (300) cubic centimeters* of Water, and, having moistened the powder with *three hundred (300) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins

to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Colchicum Seed is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM COLOCYNTHIDIS.

EXTRACT OF COLOCYNTH.

Colocynth, dried, and freed from the seeds, *one thousand grammes*. 1000 Gm.

Diluted Alcohol, *a sufficient quantity*.

Reduce the Colocynth to a coarse powder by grinding or bruising, and macerate it in *thirty-five hundred* (3500) *cubic centimeters* of Diluted Alcohol for four days, with occasional stirring; then express strongly, and strain through flannel. Pack the residue, previously broken up with the hands, firmly in a cylindrical percolator, cover it with the strainer, and gradually pour Diluted Alcohol upon it until the tincture and expressed liquid, mixed together, measure *five thousand* (5000) *cubic centimeters*. Distil off the Alcohol from the mixture by means of a water-bath, evaporate the residue to dryness, and reduce the dry mass to powder.

Extract of Colocynth should be kept in well-stoppered bottles.

Preparation: Extractum Colocynthis Compositum.

EXTRACTUM COLOCYNTHIDIS COMPOSITUM.

COMPOUND EXTRACT OF COLOCYNTH.

Extract of Colocynth, *one hundred and sixty grammes* . . . 160 Gm.

Purified Aloes, *five hundred grammes*. 500 Gm.

Cardamom, in No. 60 powder, *sixty grammes*. 60 Gm.

Resin of Scammony, in fine powder, *one hundred and forty grammes*. 140 Gm.

Soap, dried and in coarse powder, *one hundred and forty grammes*. 140 Gm.

Alcohol, *one hundred cubic centimeters* 100 Cc.

Heat the Aloes, contained in a suitable vessel, on a water-bath, until it is completely melted; then add the Alcohol, Soap, Extract of Colo-

cynth, and Resin of Scammony, and heat the mixture at a temperature not exceeding 120° C. (248° F.), until it is perfectly homogeneous, and a thread taken from the mass becomes brittle when cool. Then withdraw the heat, thoroughly incorporate the Cardamom with the mixture, and cover the vessel until the contents are cold. Finally, reduce the product to a fine powder.

Compound Extract of Colocynth should be kept in well-stoppered bottles.

Preparations: *Pilulæ Catharticæ Compositæ. Pilulæ Catharticæ Vegetabiles.*

EXTRACTUM CONII.

EXTRACT OF CONIUM.

Conium, in No. 40 powder, <i>one thousand grammes</i>	1000 Gm.
Acetic Acid, <i>twenty cubic centimeters</i>	20 Cc.
Diluted Alcohol, <i>a sufficient quantity</i> .	

Mix the Acetic Acid with *nine hundred and eighty* (980) *cubic centimeters* of Diluted Alcohol, and, having moistened the powder with *three hundred* (300) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until *three thousand* (3000) *cubic centimeters* of tincture are obtained, or until the Conium is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, in a porcelain capsule, at a temperature not exceeding 50° C. (122° F.), to *one hundred* (100) *cubic centimeters*, mix this with the reserved portion, and evaporate, at or below the above-mentioned temperature, to a pilular consistence.

EXTRACTUM CONII FLUIDUM.

FLUID EXTRACT OF CONIUM.

Conium, in No. 40 powder, <i>one thousand grammes</i>	1000 Gm.
Acetic Acid, <i>twenty cubic centimeters</i>	20 Cc.
Diluted Alcohol, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix the Acetic Acid with *nine hundred and eighty* (980) *cubic centimeters* of Diluted Alcohol, and, having moistened the powder with *three hundred* (300) *cubic centimeters* of the mixture, pack it firmly in

a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Conium is exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate, and evaporate the remainder, in a porcelain capsule, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM CONVALLARIÆ FLUIDUM.

FLUID EXTRACT OF CONVALLARIA.

Convallaria, in No. 60 powder, *one thousand grammes* . . . 1000 Gm.
Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the powder with *four hundred (400) cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Convallaria is exhausted. Reserve the first *eight hundred (800) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM CUBEÆ FLUIDUM.

FLUID EXTRACT OF CUBEÆ.

Cubeæ, in No. 60 powder, *one thousand grammes* 1000 Gm.
Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the powder with *two hundred (200) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Al-

cohol, until the Cubeb is exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM CUSSO FLUIDUM.

FLUID EXTRACT OF KOUSSO.

[EXTRACTUM BRAYERÆ FLUIDUM, PHARM. 1880.]

Koussou, in No. 40 powder, *one thousand grammes* 1000 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. 1000 Cc.

Moisten the powder with *four hundred (400) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Koussou is exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM CYPRIPEDEII FLUIDUM.

FLUID EXTRACT OF CYPRIPEDIUM.

Cypripedium, in No. 60 powder, *one thousand grammes*. . . 1000 Gm.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. 1000 Cc.

Moisten the powder with *three hundred and fifty (350) cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Cypripedium is exhausted. Reserve the first *eight hundred and fifty (850) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM DIGITALIS.

EXTRACT OF DIGITALIS.

Digitalis, in No. 60 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*.

Mix *six hundred* (600) *cubic centimeters* of Alcohol with *three hundred* (300) *cubic centimeters* of Water, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until *three thousand* (3000) *cubic centimeters* of tincture are obtained, or the Digitalis is exhausted. Distil off the Alcohol from the tincture by means of a water-bath, and evaporate the residue, on a water-bath, at a temperature not exceeding 50° C. (122° F.), to a pilular consistence.

EXTRACTUM DIGITALIS FLUIDUM.

FLUID EXTRACT OF DIGITALIS.

Digitalis, in No. 60 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. 1000 Cc.

Mix *six hundred* (600) *cubic centimeters* of Alcohol with *three hundred* (300) *cubic centimeters* of Water, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Digitalis is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM DULCAMARÆ FLUIDUM.**FLUID EXTRACT OF DULCAMARA.**

Dulcamara, in No. 60 powder, *one thousand grammes*. . . . 1000 Gm.
 Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *four hundred (400) cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Dulcamara is exhausted. Reserve the first *eight hundred (800) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM ERGOTÆ.**EXTRACT OF ERGOT.**

Fluid Extract of Ergot, *one hundred and fifty cubic centimeters*. 150 Cc.

Evaporate the Fluid Extract of Ergot in a porcelain capsule, by means of a water-bath, at a temperature not exceeding 50° C. (122° F.), constantly stirring, until it is reduced to a pilular consistence.

EXTRACTUM ERGOTÆ FLUIDUM.**FLUID EXTRACT OF ERGOT.**

Ergot, recently ground and in No. 60 powder, *one thousand grammes* 1000 Gm.

Acetic Acid, *twenty cubic centimeters*. 20 Cc.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix the Acetic Acid with *nine hundred and eighty (980) cubic centimeters* of Diluted Alcohol, and, having moistened the powder with *three hundred (300) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough of the mixture to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely

covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Ergot is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder, in a porcelain capsule, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

Preparation: Extractum Ergotæ.

EXTRACTUM ERIDICTYI FLUIDUM.

FLUID EXTRACT OF ERIDICTYON.

Eriodictyon, in No. 60 powder, *one thousand grammes* . . . 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix *eight hundred* (800) *cubic centimeters* of Alcohol with *two hundred* (200) *cubic centimeters* of Water, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Eriodictyon is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM EUCALYPTI FLUIDUM.

FLUID EXTRACT OF EUCALYPTUS.

Eucalyptus, in No. 40 powder, *one thousand grammes* . . . 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix *seven hundred and fifty* (750) *cubic centimeters* of Alcohol with *two hundred and fifty* (250) *cubic centimeters* of Water, and, having

moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Eucalyptus is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM EUONYMI.

EXTRACT OF EUONYMUS.

Euonymus, in No. 30 powder, *one thousand grammes*. . . . 1000 Gm.
Alcohol,

Water, each, *a sufficient quantity*.

Mix *six hundred* (600) *cubic centimeters* of Alcohol with *three hundred* (300) *cubic centimeters* of Water, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until *three thousand* (3000) *cubic centimeters* of tincture are obtained, or the Euonymus is exhausted. Distil off the Alcohol from the tincture by means of a water-bath, and, having placed the residue in a porcelain capsule, evaporate it, on a water-bath, to a pilular consistence.

EXTRACTUM EUPATORII FLUIDUM.

FLUID EXTRACT OF EUPATORIUM.

Eupatorium, in No. 40 powder, *one thousand grammes*. . . . 1000 Gm.
Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *four hundred* (400) *cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then

add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Eupatorium is exhausted. Reserve the first *eight hundred (800) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM FRANGULÆ FLUIDUM.

FLUID EXTRACT OF FRANGULA.

Frangula, in No. 40 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix *five hundred (500) cubic centimeters* of Alcohol with *eight hundred (800) cubic centimeters* of Water, and, having moistened the powder with *three hundred and fifty (350) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough of the menstrum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstrum, using the same proportions of Alcohol and Water as before, until the Frangula is exhausted. Reserve the first *eight hundred (800) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstrum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM GELSEMI FLUIDUM.

FLUID EXTRACT OF GELSEMIUM.

Gelsemium, in No. 60 powder, *one thousand grammes* . . . 1000 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *three hundred (300) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it.

When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Gelsemium is exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM GENTIANÆ.

EXTRACT OF GENTIAN.

Gentian, in No. 20 powder, *one thousand grammes*. 1000 Gm.
Water, *a sufficient quantity*.

Moisten the powder with *four hundred (400) cubic centimeters* of Water, and let it macerate for twenty-four hours; then pack it in a conical percolator, and gradually pour Water upon it until the infusion passes but slightly imbued with the properties of the Gentian. Reduce the liquid to three-fourths of its bulk by boiling, and strain; then, by means of a water-bath, evaporate to a pilular consistence.

EXTRACTUM GENTIANÆ FLUIDUM.

FLUID EXTRACT OF GENTIAN.

Gentian, in No. 30 powder, *one thousand grammes*. 1000 Gm.
Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *three hundred and fifty (350) cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Gentian is exhausted. Reserve the first *eight hundred (800) cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM GERANII FLUIDUM.

FLUID EXTRACT OF GERANIUM.

Geranium, in No. 30 powder, *one thousand grammes* 1000 Gm.

Glycerin, *one hundred cubic centimeters* 100 Cc.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix the Glycerin with *nine hundred (900) cubic centimeters* of Diluted Alcohol, and, having moistened the powder with *three hundred and fifty (350) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough of the menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and afterwards Diluted Alcohol, until the Geranium is exhausted. Reserve the first *seven hundred (700) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM GLYCYRRHIZÆ.

EXTRACT OF GLYCYRRHIZA.

[EXTRACT OF LIQUORICE.]

The commercial extract of the root of *Glycyrrhiza glabra* Linné (nat. ord. *Leguminosæ*).

In flattened, cylindrical rolls, from 15 to 18 Cm. long, and from 15 to 30 Mm. thick; of a glossy black color. It breaks with a sharp, conchoidal, shining fracture, and has a very sweet, peculiar taste. Not less than 60 per cent. of it should be soluble in cold water.

Preparations: Trochisci Ammonii Chloridi. Trochisci Glycyrrhizæ et Opii.

EXTRACTUM GLYCYRRHIZÆ FLUIDUM.

FLUID EXTRACT OF GLYCYRRHIZA.

Glycyrrhiza, in No. 40 powder, *one thousand grammes* . . . 1000 Gm.

Ammonia Water, *fifty cubic centimeters* 50 Cc.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix the Ammonia Water with *three hundred (300) cubic centimeters* of Alcohol and *six hundred and fifty (650) cubic centimeters* of Water, and, having moistened the powder with *three hundred and fifty (350) cubic centimeters* of the mixture, pack it firmly in a cylindrical glass percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and then a mixture of Alcohol and Water made in the proportion of *three hundred (300) cubic centimeters* of Alcohol and *six hundred and fifty (650) cubic centimeters* of Water, until the Glycyrrhiza is exhausted. Reserve the first *seven hundred and fifty (750) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough of the mixture of Alcohol and Water to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM GLYCYRRHIZÆ PURUM.

PURE EXTRACT OF GLYCYRRHIZA.

Glycyrrhiza, in No. 20 powder, *one thousand grammes* . . . 1000 Gm.
 Ammonia Water, *one hundred and fifty cubic centimeters* 150 Cc.
 Distilled Water, *a sufficient quantity*.

Mix the Ammonia Water with *three thousand (3000) cubic centimeters* of Distilled Water, and, having moistened the powder with *one thousand (1000) cubic centimeters* of the menstruum, let it macerate for twenty-four hours. Then pack it moderately in a cylindrical glass percolator, and gradually pour upon it, first, the remainder of the menstruum, and then Distilled Water, until the Glycyrrhiza is exhausted. Lastly, evaporate the infusion, by means of a water-bath, to a pilular consistence.

Preparation: Mistura Glycyrrhizæ Composita.

EXTRACTUM GOSSYPII RADICIS FLUIDUM.

FLUID EXTRACT OF COTTON ROOT BARK.

Cotton Root Bark, in No. 30 powder, *one thousand grammes* . . . 1000 Gm.
 Glycerin, *two hundred and fifty cubic centimeters* . . . 250 Cc.
 Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc,

Mix the Glycerin with *seven hundred and fifty* (750) *cubic centimeters* of Alcohol, and, having moistened the powder with *five hundred* (500) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and then Alcohol, until the Cotton Root Bark is exhausted. Reserve the first *seven hundred* (700) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM GRINDELIAE FLUIDUM.

FLUID EXTRACT OF GRINDELIA.

Grindelia, in No. 30 powder, *one thousand grammes* 1000 Gm.
Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. 1000 Cc.

Moisten the powder with *three hundred* (300) *cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Grindelia is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM GUARANÆ FLUIDUM.

FLUID EXTRACT OF GUARANA.

Guarana, in No. 80 powder, *one thousand grammes* 1000 Gm.
Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. 1000 Cc.

Mix *seven hundred and fifty* (750) *cubic centimeters* of Alcohol with *two hundred and fifty* (250) *cubic centimeters* of Water, and, having

moistened the powder with *two hundred* (200) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Guarana is exhausted. Reserve the first *eight hundred* (800) *cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM HÆMATOXYLI.

EXTRACT OF HÆMATOXYLON.

Hæmatoxylon, rasped, *one thousand grammes* 1000 Gm.
 Water, *ten thousand cubic centimeters* 10,000 Cc.

Macerate the Hæmatoxylon with the Water for forty-eight hours. Then boil (avoiding the use of metallic vessels) until one-half of the Water has evaporated; strain the decoction, while hot, and evaporate to dryness.

EXTRACTUM HAMAMELIDIS FLUIDUM.

FLUID EXTRACT OF HAMAMELIS.

Hamamelis, in No. 40 powder, *one thousand grammes* . . . 1000 Gm.
 Glycerin, *one hundred cubic centimeters* 100 Cc.
 Alcohol,
 Water, each, *a sufficient quantity*.

Mix the Glycerin with *five hundred* (500) *cubic centimeters* of Alcohol and *eight hundred* (800) *cubic centimeters* of Water, and, having moistened the powder with *three hundred and fifty* (350) *cubic centimeters* of the mixture, pack it firmly in a conical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and then a mixture of Alcohol and Water, made in the proportion of *five hundred* (500) *cubic centimeters* of Alcohol to *eight hundred* (800) *cubic centimeters* of Water, until the

Hamamelis is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM HYDRASTIS FLUIDUM.

FLUID EXTRACT OF HYDRASTIS.

Hydrastis, in No. 60 powder, *one thousand grammes* 1000 Gm.
 Glycerin, *one hundred cubic centimeters* 100 Cc.
 Alcohol,
 Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Mix the Glycerin with *six hundred* (600) *cubic centimeters* of Alcohol and *three hundred* (300) *cubic centimeters* of Water, and, having moistened the powder with *three hundred* (300) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and then a mixture of Alcohol and Water, made in the proportion of *six hundred* (600) *cubic centimeters* of Alcohol to *three hundred* (300) *cubic centimeters* of Water, until the Hydrastis is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM HYOSCYAMI.

EXTRACT OF HYOSCYAMUS.

Hyoscyamus, in No. 60 powder, *one thousand grammes* . . . 1000 Gm.
 Alcohol, *two thousand cubic centimeters* 2000 Cc.
 Water, *one thousand cubic centimeters* 1000 Cc.
 Diluted Alcohol, *a sufficient quantity*.

Mix the Alcohol and Water, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the

powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and then Diluted Alcohol, until *three thousand* (3000) *cubic centimeters* of tincture are obtained, or the Hyoscyamus is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to *one hundred* (100) *cubic centimeters*; mix this with the reserved portion, and evaporate, at or below the before-mentioned temperature, to a pilular consistence.

EXTRACTUM HYOSCYAMI FLUIDUM.

FLUID EXTRACT OF HYOSCYAMUS.

Hyoscyamus, in No. 60 powder, *one thousand grammes* . . . 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix *two thousand* (2000) *cubic centimeters* of Alcohol with *one thousand* (1000) *cubic centimeters* of Water, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Hyoscyamus is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM IPECACUANHÆ FLUIDUM.

FLUID EXTRACT OF IPECAC.

Ipecac, in No. 80 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix *seven hundred and fifty (750) cubic centimeters* of Alcohol with *two hundred and fifty (250) cubic centimeters* of Water, and, having moistened the powder with *three hundred and fifty (350) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Ipecac is exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

Preparations: Syrupus Ipecacuanhæ. Tinctura Ipecacuanhæ et Opii. Vinum Ipecacuanhæ.

EXTRACTUM IRIDIS.

EXTRACT OF IRIS.

Iris, in No. 60 powder, *one thousand grammes* 1000 Gm.
Alcohol, *a sufficient quantity*.

Moisten the powder with *four hundred (400) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until *three thousand (3000) cubic centimeters* of tincture are obtained, or the Iris is exhausted. Distil off the Alcohol from the tincture by means of a water-bath, and evaporate the residue, on a water-bath, to a pilular consistence.

EXTRACTUM IRIDIS FLUIDUM.

FLUID EXTRACT OF IRIS.

Iris, in No. 60 powder, *one thousand grammes* 1000 Gm.
Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Moisten the powder with *four hundred (400) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it.

When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Iris is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue, on a water-bath, to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM JALAPÆ.

EXTRACT OF JALAP.

Jalap, in No. 60 powder, *one thousand grammes* 1000 Gm.
Alcohol, *a sufficient quantity*.

Moisten the powder with *three hundred and fifty* (350) *cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Jalap is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, add the residue to the reserved portion, and evaporate to a pilular consistence.

Preparations: Pilulæ Catharticæ Compositæ. Pilulæ Catharticæ Vegetabiles.

EXTRACTUM JUGLANDIS.

EXTRACT OF JUGLANS.

Juglans, in No. 30 powder, *one thousand grammes* 1000 Gm.
Diluted Alcohol, *a sufficient quantity*.

Moisten the powder with *four hundred* (400) *cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until *three thousand* (3000) *cubic centimeters* of tincture are obtained, or the Juglans is exhausted. Distil off the Alcohol from the tincture by means of a water-bath, and evaporate the residue, on a water-bath, to a pilular consistence.

EXTRACTUM KRAMERIÆ.

EXTRACT OF KRAMERIA.

Krameria, in No. 40 powder, *one thousand grammes* 1000 Gm.
 Water, *a sufficient quantity*.

Moisten the powder with *three hundred (300) cubic centimeters* of Water, pack it in a conical glass percolator, and gradually pour Water upon it, until the infusion passes but slightly imbued with the astringency of the Krameria. Heat the liquid to the boiling point, strain, and evaporate the strained liquid, by means of a water-bath, at a temperature not exceeding 70° C. (158° F.), to dryness.

Preparation: Trochisci Krameriaë.

EXTRACTUM KRAMERIÆ FLUIDUM.

FLUID EXTRACT OF KRAMERIA.

Krameria, in No. 30 powder, *one thousand grammes* 1000 Gm.
 Glycerin, *one hundred cubic centimeters* 100 Cc.
 Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. 1000 Cc.

Mix the Glycerin with *nine hundred (900) cubic centimeters* of Diluted Alcohol, and, having moistened the powder with *four hundred (400) cubic centimeters* of the mixture, pack it firmly in a cylindrical glass percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and afterwards Diluted Alcohol, until the Krameria is exhausted. Reserve the first *seven hundred (700) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

Preparation: Syrupus Krameriaë.

EXTRACTUM LAPPÆ FLUIDUM.

FLUID EXTRACT OF LAPPA

Lappa, in No. 60 powder, *one thousand grammes* 1000 Gm.
 Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. 1000 Cc.

Moisten the powder with *four hundred (400) cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Lappa is exhausted. Reserve the first *eight hundred (800) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM LEPTANDRÆ.

EXTRACT OF LEPTANDRA.

Leptandra, in No. 40 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*.

Mix *seven hundred and fifty (750) cubic centimeters* of Alcohol with *two hundred and fifty (250) cubic centimeters* of Water, and, having moistened the powder with *four hundred (400) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Leptandra is exhausted. Distil off the Alcohol from the tincture by means of a water-bath, and evaporate the residue, on a water-bath, to a pilular consistence.

Preparation: *Pilulæ Catharticæ Vegetabiles*.

EXTRACTUM LEPTANDRÆ FLUIDUM.

FLUID EXTRACT OF LEPTANDRA.

Leptandra, in No. 60 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Mix *seven hundred and fifty (750) cubic centimeters* of Alcohol with *two hundred and fifty (250) cubic centimeters* of Water, and, having

moistened the powder with *four hundred (400) cubic centimeters* of the mixture, pack it moderately in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the *Leptandra* is exhausted. Reserve the first *eight hundred (800) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM LOBELIÆ FLUIDUM.

FLUID EXTRACT OF LOBELIA.

Lobelia, in No. 60 powder, *one thousand grammes* 1000 Gm.
Diluted Alcohol, a sufficient quantity,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *three hundred and fifty (350) cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the *Lobelia* is exhausted. Reserve the first *eight hundred and fifty (850) cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM LUPULINI FLUIDUM.

FLUID EXTRACT OF LUPULIN.

Lupulin, *one thousand grammes* 1000 Gm.
Alcohol, a sufficient quantity,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the Lupulin with *two hundred (200) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add

enough Alcohol to saturate the Lupulin and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Lupulin is exhausted. Reserve the first *seven hundred (700) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM MATICO FLUIDUM.

FLUID EXTRACT OF MATICO.

Matico, in No 40 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix *seven hundred and fifty (750) cubic centimeters* of Alcohol with *two hundred and fifty (250) cubic centimeters* of Water, and, having moistened the powder with *three hundred (300) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Matico is exhausted. Reserve the first *eight hundred and fifty (850) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM MENISPERMI FLUIDUM.

FLUID EXTRACT OF MENISPERMUM.

Menispermum, in No. 60 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix *six hundred (600) cubic centimeters* of Alcohol with *three hundred (300) cubic centimeters* of Water, and, having moistened the powder

with *four hundred (400) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Menispermum is exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM MEZEREI FLUIDUM.

FLUID EXTRACT OF MEZEREUM.

Mezereum, in No. 30 powder, *one thousand grammes*. . . . 1000 Gm.
Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *four hundred (400) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Mezereum is exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

Preparation: Linimentum Sinapis Compositum.

EXTRACTUM NUCIS VOMICÆ.

EXTRACT OF NUX VOMICA.

Nux Vomica, in No. 60 powder, *one thousand grammes*. . . 1000 Gm.
Acetic Acid, *fifty cubic centimeters*. 50 Cc.
Alcohol,
Water,
Ether,
Sugar of Milk, recently dried and in fine powder, each,
a sufficient quantity.

Mix Alcohol and Water in the proportion of *seven hundred and fifty* (750) *cubic centimeters* of Alcohol to *two hundred and fifty* (250) *cubic centimeters* of Water. Mix the powder with *one thousand* (1000) *cubic centimeters* of the mixture, to which the Acetic Acid had previously been added, and let it macerate, in a well-covered vessel, in a warm place, during forty-eight hours. Then pack it tightly in a cylindrical glass percolator, gradually pour menstruum upon it, and continue the percolation, until the Nux Vomica is practically exhausted. Distil off the Alcohol by means of a water-bath, transfer the remainder to a tared capsule, and evaporate it until it weighs about *one hundred and fifty* (150) *grammes*. Transfer it to a bottle of the capacity of about *five hundred* (500) *cubic centimeters*, and wash the capsule with about *fifty* (50) *cubic centimeters* of warm Water, adding the washings to the bottle and mixing the contents thoroughly. When the liquid extract is cold, add to it *one-fourth* of its volume of Ether, stopper the bottle, and bring the extract and Ether into intimate contact by gently agitating and frequently inverting the bottle, avoiding violent shaking so as to prevent the formation of an emulsion. Pour off the ethereal layer as closely as possible, and repeat this treatment with Ether several times, until a few drops of the ethereal layer no longer impart a permanent, greasy stain to filtering paper. Then transfer the contents of the bottle back to the tared capsule, using a sufficient quantity of warm Water for washing. Recover the Ether from the united ethereal washings, add to the oily residue about *fifteen* (15) *cubic centimeters* of boiling Water, and then Acetic Acid, in drops, until the mixture has a permanent acid reaction. Then filter it through a moistened filter, and wash the filter with a little Water. Add the filtrate to the extract in the capsule, evaporate until the residue weighs about *two hundred* (200) *grammes*, and allow it to become cold. Then determine its weight exactly, remove *four* (4) *grammes* of the mass, and assay this by the process given below, using the amounts of liquids there directed for *two* (2) *grammes* of dry extract. In another portion of *five* (5) *grammes* determine the amount of water by drying it, in a flat-bottomed capsule, at 100° C. (212° F.), until it ceases to lose weight. From the results thus obtained ascertain, by calculation, the amount of total alkaloids and of water contained in the remainder of the mass, add to this enough well-dried Sugar of Milk to bring the quantity of alkaloids in the final dry extract to *fifteen* (15) *per cent.*, then evaporate the mass to complete dryness, reduce it to powder, and transfer it to small, well-stoppered vials.

Extract of Nux Vomica, when assayed by the following process, should be found to contain 15 per cent. of total alkaloids.

Assay of Extract of Nux Vomica.

Extract of Nux Vomica, dried at 100° C. (212° F.), *two grammes* . . 2 Gm.
 Alcohol,
 Ammonia Water,
 Water,
 Chloroform,
 Decinormal Sulphuric Acid (V.S.),
 Centinormal Potassium Hydrate V.S., each, *a sufficient quantity*.

Put 2 Gm. of the dried Extract of Nux Vomica into a glass separator, add to it 20 Cc. of a previously prepared mixture of 2 volumes of alcohol, 1 volume of ammonia water (specific gravity 0.960), and 1 volume of water, and shake the well-stoppered separator until the extract is dissolved. Then add 20 Cc. of chloroform and agitate during five minutes. Allow the chloroform to separate, remove it as far as possible, pour into the separator a few Cc. of chloroform, and, without shaking, draw this off through the stop-cock to wash the outlet-tube. Repeat the extraction with two further portions of chloroform of 15 Cc. each, and wash the outlet-tube each time as just directed. Collect all the chloroformic solutions in a wide beaker, expose the latter to a gentle heat, on a water-bath, until the chloroform and ammonia are completely dissipated, add to the residue 10 Cc. of decinormal sulphuric acid measured with great care from a burette, stir gently, and then add 20 Cc. of hot water. When solution has taken place, add 2 Cc. of brazil wood T.S., and then carefully run in centinormal potassium hydrate V.S., until a permanent pinkish color is produced by the action of a slight excess of alkali upon the brazil wood indicator. Divide the number of Cc. of centinormal potassium V.S. used by 10, subtract the number found from 10 (the 10 Cc. of decinormal acid used), multiply the remainder by 0.0364 and that product by 50 (or, multiply at once by 1.82), which will give the percentage of *total alkaloids* in the Extract of Nux Vomica, it being assumed that strychnine and brucine are present in equal proportion, and the above factor being found by taking the mean of their respective molecular weights rounded off to whole numbers $[(334 + 394) \div 2 = 364]$.

Preparation: Tinctura Nucis Vomicae.

EXTRACTUM NUCIS VOMICÆ FLUIDUM.

FLUID EXTRACT OF NUX VOMICA.

Nux Vomica, in No. 60 powder, *one thousand grammes* . . 1000 Gm.
 Acetic Acid, *fifty cubic centimeters* 50 Cc.
 Alcohol,
 Water, each, *a sufficient quantity*.

Mix Alcohol and Water in the proportion of *seven hundred and fifty* (750) *cubic centimeters* of Alcohol and *two hundred and fifty* (250) *cubic centimeters* of Water. Moisten the powder with *one thousand* (1000) *cubic centimeters* of the mixture, to which the Acetic Acid had previously been added, and let it digest, in a well-covered vessel, in a warm place, during forty-eight hours. Then pack it in a cylindrical glass percolator, and gradually pour menstruum upon it, until the Nux Vomica is practically exhausted. Distil off the Alcohol by

means of a water-bath, transfer the remainder to a tared capsule, evaporate it until it weighs about *two hundred* (200) *grammes*, and allow it to become cold. Then determine the weight exactly, remove *four* (4) *grammes* of the mass, and assay this by the process given under Extract of Nux Vomica (see *Extractum Nucis Vomicae*), using the amounts of liquids there directed for *two* (2) *grammes* of dry extract. From the results thus obtained ascertain, by calculation, the amount of total alkaloids in the remainder of the mass, and then add to the latter, first, *three hundred* (300) *cubic centimeters* of Alcohol, and afterwards a sufficient quantity of a mixture of *three* (3) *volumes* of Alcohol and *one* (1) *volume* of Water, so that each *one hundred* (100) *cubic centimeters* of the finished fluid extract shall contain *one and five-tenths* (1.5) *grammes* of total alkaloids.

EXTRACTUM OPII.

EXTRACT OF OPIUM.

Powdered Opium, *one hundred grammes* 100 Gm.
Sugar of Milk, recently dried and in fine powder,
Water, each, *a sufficient quantity*.

Triturate the Powdered Opium in a mortar thoroughly with *one thousand* (1000) *cubic centimeters* of Water, repeat the trituration occasionally, in the course of twelve hours, then filter through a rapidly-acting, double filter, and wash the filter and residue with Water, until the filtrate is nearly colorless. Concentrate the filtrate and washings in a tared capsule, on a water-bath, until the residue weighs about *two hundred* (200) *grammes*, and allow it to become cold. Then determine the weight exactly, transfer *twelve* (12) *grammes* of it to an Erlenmeyer flask having a capacity of about *one hundred* (100) *cubic centimeters*, and determine in this portion the amount of morphine by the process of assay given below, using the quantities of liquids there directed for *four* (4) *grammes* of the dry extract. In another portion of *five* (5) *grammes* determine the amount of water by drying it in a flat-bottomed capsule, at 100° C. (212° F.), until it ceases to lose weight. From the results thus obtained ascertain, by calculation, the amount of morphine and of water contained in the remainder of the extract, add to this enough well-dried Sugar of Milk to bring the quantity of morphine in the final dry extract to *eighteen* (18) *per cent.*, then evaporate the whole to dryness, reduce it to powder, and transfer it to small, well-stoppered vials.

Assay of Extract of Opium.

Extract of Opium, dried at 100° C. (212° F.), <i>four grammes</i>	4 Gm.
Ammonia Water, <i>two and two-tenths cubic centimeters</i>	2.2 Cc.
Alcohol,	
Ether,	
Water, each, <i>a sufficient quantity</i> .	

Dissolve the Extract of Opium in 30 Cc. of water, filter the solution through a small filter, and wash the filter and residue with water, until all soluble matters are extracted, collecting the washings separately. Evaporate, in a tared capsule, first, the washings to a small volume, then add the first filtrate, and evaporate the whole to a weight of 10 Gm. Rotate the concentrated solution about in the capsule until the rings of extract are redissolved, pour the liquid into a tared Erlenmeyer flask having a capacity of about 100 Cc., and rinse the capsule with a few drops of water at a time, until the entire solution weighs 15 Gm. Then add 7 Gm. (or 8.5 Cc.) of alcohol, shake well, add 20 Cc. of ether, and shake again. Now add the ammonia water from a graduated pipette or burette, stopper the flask with a sound cork, shake it thoroughly during ten minutes, and then set it aside, in a moderately cool place, for at least six hours, or over night.

Remove the stopper carefully, and, should any crystals adhere to it, brush them into the flask. Place in a small funnel two rapidly-acting filters, of a diameter of 7 Cm., plainly folded, one within the other (the triple fold of the inner filter being laid against the single side of the outer filter), wet them well with ether, and decant the ethereal solution as completely as possible upon the inner filter. Add 10 Cc. of ether to the contents of the flask, rotate it, and again decant the ethereal layer upon the inner filter. Repeat this operation with another portion of 10 Cc. of ether. Then pour into the filter the liquid in the flask, in portions, in such a way as to transfer the greater portion of the crystals to the filter, and, when this has passed through, transfer the remaining crystals to the filter by washing the flask with several portions of water, using not more than about 10 Cc. in all. Allow the double filter to drain, then apply water to the crystals, drop by drop, until they are practically free from mother-water, and afterwards wash them, drop by drop, from a pipette, with alcohol previously saturated with powdered morphine. When this has passed through, displace the remaining alcohol by ether, using about 10 Cc., or more if necessary. Allow the filter to dry in a moderately warm place, at a temperature not exceeding 60° C. (140° F.), until its weight remains constant, then carefully transfer the crystals to a tared watch-glass and weigh them.

The weight found, multiplied by 25, represents the amount of crystallized morphine obtained from 100 Gm. of the Extract.

Preparation: Emplastrum Opii.

EXTRACTUM PAREIRÆ FLUIDUM.

FLUID EXTRACT OF PAREIRA.

Pareira, in No. 40 powder, <i>one thousand grammes</i>	1000 Gm.
Glycerin, <i>one hundred cubic centimeters</i>	100 Cc.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* 1000 Cc.

Mix the Glycerin with *seven hundred and twenty (720) cubic centimeters* of Alcohol and *one hundred and eighty (180) cubic centimeters* of Water,

and, having moistened the powder with *four hundred (400) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and afterwards a mixture of Alcohol and Water, made in the proportion of *four hundred (400) cubic centimeters* of Alcohol to *one hundred (100) cubic centimeters* of Water, until the Pareira is exhausted. Reserve the first *eight hundred and fifty (850) cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM PHYSOSTIGMATIS.

EXTRACT OF PHYSOSTIGMA.

Physostigma, in No. 80 powder, *one thousand grammes*. . . 1000 Gm.
Alcohol, *a sufficient quantity*.

Moisten the powder with *four hundred (400) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until *three thousand (3000) cubic centimeters* of tincture are obtained, or the Physostigma is exhausted. Reserve the first *nine hundred (900) cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to *one hundred (100) cubic centimeters*; mix this with the reserved portion, and evaporate, at or below the before-mentioned temperature, on a water-bath, to a pilular consistence.

EXTRACTUM PHYTOLACCÆ RADICIS FLUIDUM.

FLUID EXTRACT OF PHYTOLACCA ROOT.

Phytolacca Root, in No. 60 powder, *one thousand grammes* 1000 Gm.
Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . 1000 Cc.

Mix *six hundred* (600) *cubic centimeters* of Alcohol with *three hundred* (300) *cubic centimeters* of Water, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the *Phytolacca Root* is exhausted. Reserve the first *eight hundred* (800) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM PILOCARPI FLUIDUM.

FLUID EXTRACT OF PILOCARPUS.

Pilocarpus, in No. 40 powder, *one thousand grammes* . . . 1000 Gm.
Diluted Alcohol, a *sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the powder with *three hundred and fifty* (350) *cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the *Pilocarpus* is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM PODOPHYLLI.

EXTRACT OF PODOPHYLLUM.

Podophyllum, in No. 60 powder, *one thousand grammes* . . 1000 Gm.
Alcohol,
Water, each, a *sufficient quantity*.

Mix *eight hundred* (800) *cubic centimeters* of Alcohol with *two hundred* (200) *cubic centimeters* of Water, and, having moistened the powder

with *three hundred (300) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Podophyllum is exhausted. Distil off the Alcohol from the tincture by means of a water-bath, and evaporate the residue, on a water-bath, to a pilular consistence.

EXTRACTUM PODOPHYLLI FLUIDUM.

FLUID EXTRACT OF PODOPHYLLUM.

Podophyllum, in No. 60 powder, *one thousand grammes*.. 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix *eight hundred (800) cubic centimeters* of Alcohol with *two hundred (200) cubic centimeters* of Water, and, having moistened the powder with *three hundred (300) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Podophyllum is exhausted. Reserve the first *eight hundred and fifty (850) cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

EXTRACTUM PRUNI VIRGINIANÆ FLUIDUM.

FLUID EXTRACT OF WILD CHERRY.

Wild Cherry, in No. 20 powder, *one thousand grammes*.. 1000 Gm.

Glycerin, *one hundred cubic centimeters* 100 Cc.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Glycerin with *two hundred* (200) *cubic centimeters* of Water, and, having moistened the powder with the mixture, pack it firmly in a cylindrical glass percolator, and, having closely covered the percolator, macerate for forty-eight hours; then gradually add menstruum, made in the proportion of *eight hundred and fifty* (850) *cubic centimeters* of Alcohol, to *one hundred and fifty* (150) *cubic centimeters* of Water, and allow the percolation to proceed until the Wild Cherry is exhausted. Reserve the first *eight hundred* (800) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract. Dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM QUASSIÆ.

EXTRACT OF QUASSIA.

Quassia, in No. 20 powder, *one thousand grammes* 1000 Gm.
Water, a sufficient quantity.

Moisten the powder with *four hundred* (400) *cubic centimeters* of Water, pack it firmly in a conical percolator, and gradually pour Water upon it until the infusion passes but slightly imbued with bitterness. Reduce the liquid to three-fourths of its bulk by boiling, and strain; then evaporate, by means of a water-bath, to a pilular consistence.

EXTRACTUM QUASSIÆ FLUIDUM.

FLUID EXTRACT OF QUASSIA.

Quassia, in No. 60 powder, *one thousand grammes* 1000 Gm.
Alcohol,
Water, each, a sufficient quantity,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix *three hundred* (300) *cubic centimeters* of Alcohol with *six hundred* (600) *cubic centimeters* of Water, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Quassia is

exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM RHAMNI PURSHIANÆ FLUIDUM.

FLUID EXTRACT OF RHAMNUS PURSHIANA.

Rhamnus Purshiana, in No. 60 powder, *one thousand grammes*..... 1000 Gm.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Moisten the powder with *four hundred* (400) *cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Rhamnus Purshiana is exhausted. Reserve the first *eight hundred* (800) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM RHEI.

EXTRACT OF RHUBARB.

Rhubarb, in No. 30 powder, *one thousand grammes* 1000 Gm.
Alcohol,

Water, each, *a sufficient quantity*.

Mix *eight hundred* (800) *cubic centimeters* of Alcohol with *two hundred* (200) *cubic centimeters* of Water, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a conical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the tincture passes nearly tasteless. Reserve the first *one thousand* (1000) *cubic centimeters* of the percolate, and set it aside in a warm place, until it

is reduced by spontaneous evaporation to *five hundred (500) cubic centimeters*. Evaporate the remainder of the percolate, in a porcelain vessel, by means of a water-bath, at a temperature not exceeding 70° C. (158° F.), to the consistence of syrup. Mix this with the reserved portion, and continue the evaporation, at or below the before-mentioned temperature, until the mixture is reduced to a pilular consistence.

EXTRACTUM RHEI FLUIDUM.

FLUID EXTRACT OF RHUBARB.

Rhubarb, in No. 30 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. 1000 Cc.

Mix *eight hundred (800) cubic centimeters* of Alcohol with *two hundred (200) cubic centimeters* of Water, and, having moistened the powder with *four hundred (400) cubic centimeters* of the mixture, pack it firmly in a conical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Rhubarb is exhausted. Reserve the first *seven hundred and fifty (750) cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 70° C. (158° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

Preparations: Mistura Rhei et Sodæ. Syrupus Rhei.

EXTRACTUM RHOIS GLABRÆ FLUIDUM.

FLUID EXTRACT OF RHUS GLABRA.

Rhus Glabra, in No. 40 powder, *one thousand grammes* . . . 1000 Gm.

Glycerin, *one hundred cubic centimeters* 100 Cc.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. 1000 Cc.

Mix the Glycerin with *nine hundred (900) cubic centimeters* of Diluted Alcohol, and, having moistened the powder with *three hundred and fifty (350) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the

percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and afterwards Diluted Alcohol, until the *Rhus Glabra* is exhausted. Reserve the first *eight hundred* (800) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM ROSÆ FLUIDUM.

FLUID EXTRACT OF ROSE.

Red Rose, in No. 30 powder, <i>one thousand grammes</i>	1000 Gm.
Glycerin, <i>one hundred cubic centimeters</i>	100 Cc.
Diluted Alcohol, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix the Glycerin with *nine hundred* (900) *cubic centimeters* of Diluted Alcohol, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical glass percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and afterwards Diluted Alcohol, until the Red Rose is exhausted. Reserve the first *seven hundred and fifty* (750) *cubic centimeters* of the percolate, and evaporate the remainder, in a porcelain capsule, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

Preparations: Mel Rosæ. Syrupus Rosæ.

EXTRACTUM RUBI FLUIDUM.

FLUID EXTRACT OF RUBUS.

Rubus, in No. 60 powder, <i>one thousand grammes</i>	1000 Gm.
Glycerin, <i>one hundred cubic centimeters</i>	100 Cc.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix the Glycerin with *six hundred* (600) *cubic centimeters* of Alcohol and *three hundred* (300) *cubic centimeters* of Water, and, having moist-

ened the powder with *three hundred and fifty* (350) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and afterwards a mixture of Alcohol and Water, made in the proportion of *six hundred* (600) *cubic centimeters* of Alcohol to *three hundred* (300) *cubic centimeters* of Water, until the Rubus is exhausted. Reserve the first *seven hundred* (700) *cubic centimeters* of the percolate. Distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add enough of a mixture of Alcohol and Water, using the last-named proportions, to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

Preparation: Syrupus Rubi.

EXTRACTUM RUMICIS FLUIDUM.

FLUID EXTRACT OF RUMEX.

Rumex, in No. 40 powder, *one thousand grammes*. 1000 Gm.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *three hundred and fifty* (350) *cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Rumex is exhausted. Reserve the first *eight hundred* (800) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM SABINÆ FLUIDUM.

FLUID EXTRACT OF SAVINE.

Savine, in No. 40 powder, *one thousand grammes*. 1000 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *two hundred and fifty* (250) *cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Savine is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM SANGUINARIÆ FLUIDUM.

FLUID EXTRACT OF SANGUINARIA.

Sanguinaria, in No. 60 powder, *one thousand grammes* . . . 1000 Gm.

Acetic Acid, *fifty cubic centimeters* 50 Cc.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix Alcohol and Water in the proportion of *seven hundred and fifty* (750) *cubic centimeters* of Alcohol and *two hundred and fifty* (250) *cubic centimeters* of Water. Moisten the powder with *three hundred* (300) *cubic centimeters* of the mixture, to which the Acetic Acid had previously been added, and let it macerate, in a well-covered vessel, in a warm place, during forty-eight hours. Then pack it firmly in a cylindrical percolator, and gradually pour menstruum upon it, until the Sanguinaria is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM SARSAPARILLÆ FLUIDUM.

FLUID EXTRACT OF SARSAPARILLA.

Sarsaparilla, in No. 30 powder, *one thousand grammes* . . . 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix *three hundred (300) cubic centimeters* of Alcohol with *six hundred (600) cubic centimeters* of Water, and, having moistened the powder with *four hundred (400) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Sarsaparilla is exhausted. Reserve the first *eight hundred (800) cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand (1000) cubic centimeters*.

Preparation: Syrupus Sarsaparillæ Compositus.

EXTRACTUM SARSAPARILLÆ FLUIDUM COMPOSITUM.

COMPOUND FLUID EXTRACT OF SARSAPARILLA.

Sarsaparilla, in No. 30 powder, <i>seven hundred and fifty grammes</i>	750 Gm.
Glycyrrhiza, in No. 30 powder, <i>one hundred and twenty grammes</i>	120 Gm.
Sassafras, in No. 30 powder, <i>one hundred grammes</i>	100 Gm.
Mezereum, in No. 30 powder, <i>thirty grammes</i>	30 Gm.
Glycerin, <i>one hundred cubic centimeters</i>	100 Cc.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Glycerin with *three hundred (300) cubic centimeters* of Alcohol and *six hundred (600) cubic centimeters* of Water, and, having moistened the mixed powders with *four hundred (400) cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and afterwards a mixture of Alcohol and Water, made in the proportion of *three hundred (300) cubic centimeters* of Alcohol to *six hundred (600) cubic centimeters* of Water, until the powder is exhausted. Reserve the first *eight hundred (800) cubic centimeters* of the percolate, and evaporate the remainder to

a soft extract; dissolve this in the reserved portion, and add enough of a mixture of Alcohol and Water, using the last-named proportions, to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM SCILLÆ FLUIDUM.

FLUID EXTRACT OF SQUILL.

Squill, in No. 20 powder, *one thousand grammes*. 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix *seven hundred and fifty* (750) *cubic centimeters* of Alcohol with *two hundred and fifty* (250) *cubic centimeters* of Water, and, having moistened the powder with *two hundred* (200) *cubic centimeters* of the mixture, pack it in a cylindriæal percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Squill is exhausted. Reserve the first *seven hundred and fifty* (750) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

Preparation: Syrupus Scillæ Compositus.

EXTRACTUM SCOPARII FLUIDUM.

FLUID EXTRACT OF SCOPARIUS.

Scoparius, in No. 60 powder, *one thousand grammes*. 1000 Gm.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *three hundred and fifty* (350) *cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindriæal percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Scoparius is

exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM SCUTELLARIÆ FLUIDUM.

FLUID EXTRACT OF SCUTELLARIA.

Scutellaria, in No. 40 powder, *one thousand grammes*. . . . 1000 Gm.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *three hundred and fifty* (350) *cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Scutellaria is exhausted. Reserve the first *eight hundred* (800) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM SENEGÆ FLUIDUM.

FLUID EXTRACT OF SENEGA.

Senega, in No. 40 powder, *one thousand grammes*. 1000 Gm.

Ammonia Water, *fifty cubic centimeters*. 50 Cc.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix the Ammonia Water with *seven hundred and fifty* (750) *cubic centimeters* of Alcohol and *two hundred* (200) *cubic centimeters* of Water, and, having moistened the powder with *four hundred and fifty* (450) *cubic centimeters* of the mixture, pack it firmly in a cylindrical glass percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed,

gradually adding, first, the remainder of the menstruum, and then a mixture of Alcohol and Water, made in the proportion of *seven hundred and fifty* (750) *cubic centimeters* of Alcohol to *two hundred and fifty* (250) *cubic centimeters* of Water, until the Senega is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder, in a porcelain capsule, to a soft extract; dissolve this in the reserved portion, and add enough of the last-mentioned mixture of Alcohol and Water to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

Preparation: Syrupus Scillæ Compositus. Syrupus Senegæ.

EXTRACTUM SENNÆ FLUIDUM.

FLUID EXTRACT OF SENNA.

Senna, in No. 30 powder, *one thousand grammes* 1000 Gm.
Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the powder with *four hundred* (400) *cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol until the Senna is exhausted. Reserve the first *eight hundred* (800) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

Preparation: Syrupus Sarsaparillæ Compositus.

EXTRACTUM SERPENTARIÆ FLUIDUM.

FLUID EXTRACT OF SERPENTARIA.

Serpentaria, in No. 60 powder, *one thousand grammes* . . . 1000 Gm.
Alcohol,
Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Mix *eight hundred* (800) *cubic centimeters* of Alcohol with *two hundred* (200) *cubic centimeters* of Water, and, having moistened the powder with *three hundred* (300) *cubic centimeters* of the mixture, pack it firmly in a cylindrical glass percolator; then add enough menstruum to satu-

rate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the *Serpentaria* is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM SPIGELIÆ FLUIDUM.

FLUID EXTRACT OF SPIGELIA.

Spigelia, in No. 60 powder, *one thousand grammes* 1000 Gm.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Moisten the powder with *three hundred* (300) *cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the *Spigelia* is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM STILLINGIÆ FLUIDUM.

FLUID EXTRACT OF STILLINGIA.

Stillingia, in No. 40 powder, *one thousand grammes* 1000 Gm.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Moisten the powder with *three hundred* (300) *cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradu-

ally adding Diluted Alcohol, until the *Stillingia* is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM STRAMONII SEMINIS.

EXTRACT OF STRAMONIUM SEED.

[EXTRACTUM STRAMONII, PHARM. 1880.]

Stramonium Seed, in No. 60 powder, *one thousand grammes*..... 1000 Gm.
Diluted Alcohol, *a sufficient quantity*.

Moisten the powder with *three hundred* (300) *cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until *three thousand* (3000) *cubic centimeters* of tincture are obtained, or the Stramonium Seed is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to *one hundred* (100) *cubic centimeters*; mix this with the reserved portion, and, by means of a water-bath, evaporate, at or below the before-mentioned temperature, to a pilular consistence.

Preparation: Unguentum Stramonii.

EXTRACTUM STRAMONII SEMINIS FLUIDUM.

FLUID EXTRACT OF STRAMONIUM SEED.

[EXTRACTUM STRAMONII FLUIDUM, PHARM. 1880.]

Stramonium Seed, in No. 60 powder, *one thousand grammes*..... 1000 Gm.
Alcohol,
Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix *seven hundred and fifty* (750) *cubic centimeters* of Alcohol with *two hundred and fifty* (250) *cubic centimeters* of Water, and, having

moistened the powder with *two hundred* (200) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Stramonium Seed is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM TARAXACI.

EXTRACT OF TARAXACUM.

Taraxacum, freshly gathered in autumn, *a convenient quantity*,
Water, *a sufficient quantity*.

Slice the Taraxacum, and bruise it in a stone mortar, sprinkling Water over it from time to time, until it is reduced to a pulp; then express and strain the juice, and evaporate it in a vacuum-apparatus, or in a shallow porcelain dish, by means of a water-bath, to a pilular consistence.

Keep the Extract in a close vessel, and cover its surface with a cloth, which ought to be moistened occasionally with a little ether or chloroform.

EXTRACTUM TARAXACI FLUIDUM.

FLUID EXTRACT OF TARAXACUM.

Taraxacum, in No. 30 powder, *one thousand grammes* . . . 1000 Gm.
Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the powder with *three hundred* (300) *cubic centimeters* of Diluted Alcohol, and pack it firmly in a cylindrical percolator; then add enough Diluted Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Diluted Alcohol, until the Taraxacum is exhausted. Reserve

the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate; distil off the Alcohol from the remainder by means of a water-bath, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add enough Diluted Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM TRITICI FLUIDUM.

FLUID EXTRACT OF TRITICUM.

Triticum, finely cut, *one thousand grammes* 1000 Gm.
 Alcohol,
 Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Pack the Triticum in a cylindrical percolator, pour Boiling Water upon it, and allow the percolation to proceed, supplying boiling water, as required, until the Triticum is exhausted. Evaporate the percolate to *seven hundred and fifty* (750) *cubic centimeters*, and, having added to it *two hundred and fifty* (250) *cubic centimeters* of Alcohol, mix well and set it aside for forty-eight hours. Then filter the liquid and add to the filtrate enough of a mixture of Alcohol and Water made in the proportion of *one* (1) *volume* of Alcohol to *three* (3) *volumes* of Water to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM UVÆ URSI.

EXTRACT OF UVA URSI.

Uva Ursi, in No. 30 powder, *one thousand grammes* 1000 Gm.
 Alcohol,
 Water, each, *a sufficient quantity*.

Mix *two hundred* (200) *cubic centimeters* of Alcohol with *five hundred* (500) *cubic centimeters* of Water, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical glass percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Uva Ursi is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate; evaporate the remainder, at a temperature not

exceeding 50° C. (122° F.), to *one hundred* (100) *cubic centimeters*. Mix this with the reserved portion, and evaporate, at or below the before-mentioned temperature, on a water-bath, to a pilular consistence.

EXTRACTUM UVÆ URSI FLUIDUM.

FLUID EXTRACT OF UVA URSI.

Uva Ursi, in No. 30 powder, *one thousand grammes* 1000 Gm.

Glycerin, *three hundred cubic centimeters* 300 Cc.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Mix the Glycerin with *two hundred* (200) *cubic centimeters* of Alcohol and *five hundred* (500) *cubic centimeters* of Water, and, having moistened the powder with *four hundred* (400) *cubic centimeters* of the mixture, pack it firmly in a cylindrical glass percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding, first, the remainder of the menstruum, and afterwards a mixture of Alcohol and Water, made in the proportion of *two hundred* (200) *cubic centimeters* of Alcohol to *five hundred* (500) *cubic centimeters* of Water, until the Uva Ursi is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough of the mixture of Alcohol and Water to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM VALERIANÆ FLUIDUM.

FLUID EXTRACT OF VALERIAN.

Valerian, in No. 60 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Mix *seven hundred and fifty* (750) *cubic centimeters* of Alcohol with *two hundred and fifty* (250) *cubic centimeters* of Water, and, having moistened the powder with *three hundred* (300) *cubic centimeters* of the mixture, pack it firmly in a cylindrical percolator; then add enough menstruum

to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Valerian is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM VERATRI VIRIDIS FLUIDUM.

FLUID EXTRACT OF VERATRUM VIRIDE.

Veratrum Viride, in No. 60 powder, *one thousand grammes* 1000 Gm.
Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *three hundred* (300) *cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Veratrum Viride is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM VIBURNI OPULI FLUIDUM.

FLUID EXTRACT OF VIBURNUM OPULUS.

Viburnum Opulus, in No. 60 powder, *one thousand grammes*. 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix *seven hundred and fifty* (750) *cubic centimeters* of Alcohol with *two hundred and fifty* (250) *cubic centimeters* of Water, and, having moistened the powder with *three hundred* (300) *cubic centimeters* of the mixture,

pack it moderately in a cylindrical percolator ; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Viburnum Opulus is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract ; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM VIBURNI PRUNIFOLII FLUIDUM.

FLUID EXTRACT OF VIBURNUM PRUNIFOLIUM.

Viburnum Prunifolium, in No. 60 powder, *one thousand*
grammes 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix *seven hundred and fifty* (750) *cubic centimeters* of Alcohol with *two hundred and fifty* (250) *cubic centimeters* of Water, and, having moistened the powder with *three hundred* (300) *cubic centimeters* of the mixture, pack it moderately in a cylindrical percolator ; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding menstruum, using the same proportions of Alcohol and Water as before, until the Viburnum Prunifolium is exhausted. Reserve the first *eight hundred and fifty* (850) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract ; dissolve this in the reserved portion, and add enough menstruum to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM XANTHOXYLI FLUIDUM.

FLUID EXTRACT OF XANTHOXYLUM.

Xanthoxylum, in No. 40 powder, *one thousand grammes* . . 1000 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the powder with *two hundred and fifty* (250) *cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the *Xanthoxylum* is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

EXTRACTUM ZINGIBERIS FLUIDUM.

FLUID EXTRACT OF GINGER.

Ginger, in No. 40 powder, *one thousand grammes* 1000 Gm.
Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. 1000 Cc.

Moisten the powder with *two hundred and fifty* (250) *cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until the Ginger is exhausted. Reserve the first *nine hundred* (900) *cubic centimeters* of the percolate, and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract; dissolve this in the reserved portion, and add enough Alcohol to make the Fluid Extract measure *one thousand* (1000) *cubic centimeters*.

Preparation: Syrupus Zingiberis.

FEL BOVIS.

OXGALL.

[FEL TAURI.]

The fresh bile of *Bos Taurus* Linné (class *Mammalia*; order *Ruminantia*).

A brownish-green or dark green, somewhat viscid liquid, having a peculiar, unpleasant odor, and a disagreeable, bitter taste.

Specific gravity: 1.018 to 1.028 at 15° C. (59° F.).

It is neutral, or has a faintly alkaline reaction on litmus paper.

A mixture of 2 drops of Oxgall and 10 Cc. of water, when treated, first, with a drop of a freshly prepared solution of 1 part of sugar in 4 parts of water, and afterwards with sulphuric acid, cautiously added, until the precipitate first formed is redissolved, gradually acquires a brownish-red color, changing, successively, to carmine, purple, and violet.

Preparation: Fel Bovis Purificatum.

FEL BOVIS PURIFICATUM.

PURIFIED OXGALL.

Fresh Oxgall, <i>three hundred cubic centimeters</i>	300 Cc.
Alcohol, <i>one hundred cubic centimeters</i>	100 Cc.

Evaporate the Oxgall, in a tared porcelain capsule, on a water-bath, to about *one hundred* (100) *grammes*, then add to it the Alcohol, mix the whole thoroughly, and set it aside, well covered, for three or four days. Then decant the clear solution, filter the remainder, and, having mixed the liquids and distilled off the Alcohol, evaporate the remainder to a pilular consistence.

A yellowish-green, soft solid, having a peculiar odor, and a partly sweet and partly bitter taste.

Very soluble in water and in alcohol.

A solution of 1 part of Purified Oxgall in about 100 parts of water behaves towards sugar and sulphuric acid in the same manner as the solution mentioned under Oxgall (see *Fel Bovis*).

An aqueous solution of Purified Oxgall should be clear, and should remain transparent upon the addition of an equal volume of alcohol (evidence of proper purification).

FERRI CARBONAS SACCHARATUS.

SACCHARATED FERROUS CARBONATE.

Ferrous Sulphate, <i>fifty grammes</i>	50 Gm.
Sodium Bicarbonate, <i>thirty-five grammes</i>	35 Gm.
Sugar, in fine powder,	
Distilled Water, each, <i>a sufficient quantity</i> ,	
To make <i>one hundred grammes</i>	100 Gm.

Dissolve the Ferrous Sulphate in *two hundred* (200) *cubic centimeters* of hot Distilled Water, and the Sodium Bicarbonate in *five hundred* (500) *cubic centimeters* of Distilled Water at a temperature not exceeding 50° C. (122° F.), and filter the solutions separately. To the solution of Sodium Bicarbonate contained in a flask having a capacity of about *one thousand* (1000) *cubic centimeters* add, gradually, the solution of Ferrous Sulphate, and mix thoroughly by rotating the flask. Fill up the flask with boiling Distilled Water, cork it loosely, and set the mixture aside. When the precipitate has subsided, draw off the clear, supernatant liquid by means of a siphon, and then fill the flask

again with hot Distilled Water, and shake it. Again draw off the clear liquid, and repeat the washing with hot Distilled Water in the same manner until the decanted liquid gives not more than a slight cloudiness with barium chloride test-solution. Finally drain the precipitate thoroughly on a muslin strainer, transfer it to a porcelain capsule containing *eighty* (80) *grammes* of Sugar, and mix intimately. Evaporate the mixture to dryness, by means of a water-bath, reduce it to powder, and mix intimately with it, if necessary, enough well-dried Sugar to make the final product weigh *one hundred* (100) *grammes*.

Keep the product in small, well-stoppered bottles.

A greenish-brown powder, gradually becoming oxidized by contact with air, without odor, and having at first a sweetish, afterwards a slightly ferruginous, taste.

Only partially soluble in water, but completely soluble in hydrochloric acid, with copious evolution of carbonic acid gas, forming a clear, greenish-yellow liquid.

If 1 Gm. of Saccharated Ferrous Carbonate be dissolved in 5 Cc. of hydrochloric acid, and the solution diluted with water to the measure of 50 Cc., portions of this solution will afford a blue precipitate with both potassium ferrocyanide T.S. and potassium ferricyanide T.S., but should not be affected by barium chloride T.S. (absence of *sulphate*).

If 1.16 (1.1573) Gm. of Saccharated Ferrous Carbonate be dissolved in 10 Cc. of diluted sulphuric acid, and the solution diluted with water to about 100 Cc., it should require about 15 Cc. of decinormal potassium permanganate V.S. to impart a permanent pink tint to the liquid, corresponding to about 15 per cent. of ferrous carbonate (each Cc. of the volumetric solution indicating 1 per cent. of pure Ferrous Carbonate).

FERRI CHLORIDUM.

FERRIC CHLORIDE.



Iron, in the form of fine, bright wire, and cut into small pieces, *fifteen grammes* 15 Gm.

Hydrochloric Acid,

Nitric Acid,

Distilled Water, each, *a sufficient quantity*.

Introduce the Iron wire into a flask having a capacity of about *two hundred* (200) *cubic centimeters*, pour upon it *fifty-four* (54) *grammes* of Hydrochloric Acid, previously diluted with *twenty-five* (25) *cubic centimeters* of Distilled Water, and let the mixture stand in a moderately warm place until effervescence ceases; then heat it to the boiling point, filter it through paper, and, having rinsed the flask and Iron wire with a little hot Distilled Water, pass the rinsings through the filter. To the filtered liquid add *twenty-eight* (28) *grammes* of Hydrochloric Acid, add the mixture, slowly and gradually, in a stream, to *eight* (8) *grammes* of Nitric Acid, contained in a capacious porcelain

vessel, and warm gently. After effervescence ceases, apply heat, by means of a sand-bath, until the liquid is free from nitrous odor. Then test a few drops of the liquid, diluted with water, with freshly prepared potassium ferricyanide test-solution. Should this reagent produce a blue color, add a little more Nitric Acid, drop by drop, as long as effervescence is observed, and evaporate off the excess. Then add *five* (5) *grammes* of Hydrochloric Acid, and enough Distilled Water to make the whole weigh *sixty* (60) *grammes*, and set this aside, covered with glass, until it forms a solid crystalline mass. Lastly, break the salt into pieces, and keep it in a glass-stoppered bottle, protected from light.

Orange-yellow, crystalline pieces, odorless, or having a faint odor of hydrochloric acid, and a strongly styptic taste. Very deliquescent in moist air.

Freely and completely soluble in water and in alcohol; also in a mixture of 1 part of ether and 3 parts of alcohol.

At 35.5° C. (96° F.) the salt melts, forming a reddish-brown liquid. When strongly heated, it decomposes with the loss of water and hydrochloric acid, while the anhydrous salt sublimes, leaving a residue of ferric oxide.

The dilute, aqueous solution of the salt is acid to litmus paper, yields a brownish-red precipitate with ammonia water, a blue one with potassium ferrocyanide T.S., and a white one, insoluble in nitric acid, with silver nitrate T.S.

If the iron be completely precipitated from a solution of the salt by an excess of ammonia water, the filtrate should be colorless, and should not yield either a white or a dark-colored precipitate with hydrogen sulphide T.S. (absence of *zinc* or *copper*); nor should it leave a fixed residue on evaporation and gentle ignition (absence of *salts of the fixed alkalis*).

On adding a clear crystal of ferrous sulphate to a cooled mixture of equal volumes of concentrated sulphuric acid and a moderately dilute solution of the salt, the crystal should not become colored brown, nor should there be a brownish-black color developed around it (absence of *nitric acid*).

If to a dilute solution of the salt a few drops of freshly prepared potassium ferricyanide T.S. be added, a pure brown color should be produced, without a tinge of green or greenish-blue (absence of *ferrous salt*).

A 1-per-cent. aqueous solution of the salt, when boiled in a test-tube, should remain clear (absence of *oxychloride*).

If 0.56 (0.5588) Gm. of the salt be dissolved in a glass-stoppered bottle (having a capacity of about 100 Cc.), in 10 Cc. of water and 2 Cc. of hydrochloric acid, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require 20 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 1 per cent. of metallic iron).

FERRI CITRAS.

FERRIC CITRATE.

Solution of Ferric Citrate, a convenient quantity.

Evaporate the Solution on a water-bath, at a temperature not exceeding 60° C. (140° F.), to the consistence of syrup, and spread it on plates of glass, so that, when dry, the salt may be obtained in scales.

Keep the product in well-stoppered bottles, protected from light.

Thin, transparent, garnet-red scales, without odor, and having a slightly ferruginous taste.

Slowly but completely soluble in cold water, and readily soluble in hot water, but diminishing in solubility by age. Insoluble in alcohol.

When strongly heated, the salt chars, and finally leaves a residue of ferric oxide, which should not have an alkaline reaction upon litmus paper (absence of *citrates* or *tartrates of the fixed alkalies*).

The aqueous solution of the salt has an acid reaction, and is not precipitated, but rendered darker in color, by ammonia water.

With potassium ferrocyanide T.S. it produces a bluish-green color or precipitate, which is increased and rendered dark blue by the subsequent addition of hydrochloric acid (difference from *iron* and *ammonium citrate*).

When heated with potassium or sodium hydrate T.S., it affords a brownish-red precipitate, without evolving any vapor of *ammonia*.

If a 10-per-cent. solution of the salt be deprived of its iron by boiling it with an excess of potassium or sodium hydrate T.S., and the filtrate be slightly acidulated with acetic acid, a portion of the cooled liquid, mixed with a little calcium chloride T.S., and again heated to boiling, will gradually afford a white, crystalline precipitate.

Another portion of the acidulated and cooled liquid, when allowed to stand for some time, should not deposit a white, crystalline precipitate (absence of *tartrate*).

If 0.56 (0.5588) Gm. of the salt be dissolved in a glass-stoppered bottle (having a capacity of about 100 Cc.) in 15 Cc. of water and 2 Cc. of hydrochloric acid, with the aid of a gentle heat, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require about 16 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 1 per cent. of metallic iron).

Preparations: Ferri et Quininæ Citras. Ferri et Quininæ Citras Solubilis.

FERRI ET AMMONII CITRAS.

IRON AND AMMONIUM CITRATE.

Solution of Ferric Citrate, one hundred cubic centimeters . . . 100 Cc.

Ammonia Water, forty cubic centimeters 40 Cc.

Mix the Solution of Ferric Citrate with the Ammonia Water, evaporate the mixture, by means of a water-bath, at a temperature not exceeding 60° C. (140° F.), to the consistence of syrup, and spread it on plates of glass, so that, when dry, the salt may be obtained in scales.

Keep the product in well-stoppered bottles, protected from light.

Thin, transparent, garnet-red scales, without odor, and having a saline, mildly ferruginous taste; deliquescent in moist air.

Readily and completely soluble in water, but insoluble in alcohol.

When strongly heated, the salt chars, and finally leaves a residue of ferric oxide, which should not have an alkaline reaction towards litmus paper (absence of *citrates* or *tartrates of the fixed alkalies*).

The aqueous solution of the salt is neutral to litmus paper.

The aqueous solution is not precipitated, but rendered darker in color, by ammonia water.

With potassium ferrocyanide T.S. the solution does not give a blue color or precipitate, unless it be acidulated with hydrochloric acid (difference from *ferric citrate*).

When heated with potassium or sodium hydrate T.S., it affords a brownish-red precipitate, and vapor of ammonia is evolved.

If a 10-per-cent. solution of the salt be deprived of its iron by boiling it with an excess of potassium or sodium hydrate T.S., and the filtrate slightly acidulated with acetic acid, a portion of the cooled liquid, mixed with a little calcium chloride T.S., and again heated to boiling, will gradually deposit a white, crystalline precipitate.

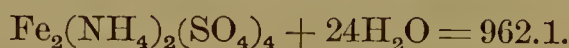
Another portion of the acidulated and cooled liquid, when allowed to stand for some time, should not yield a white crystalline precipitate (absence of *tartrate*).

If 0.56 (0.5588) Gm. of the salt be dissolved in a glass-stoppered bottle (having a capacity of about 100 Cc.) in 15 Cc. of water and 2 Cc. of hydrochloric acid, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require about 16 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 1 per cent. of metallic iron).

Preparations: *Ferri et Strychninæ Citras.* *Vinum Ferri Citratis.*

FERRI ET AMMONII SULPHAS.

FERRIC AMMONIUM SULPHATE.



[AMMONIO-FERRIC SULPHATE. AMMONIO-FERRIC ALUM.]

Ferric Ammonium Sulphate should be kept in well-stoppered bottles.

Pale violet, octohedral crystals, without odor, and having an acid, styptic taste; efflorescent on exposure to the air.

Soluble in 3 parts of water at 15° C. (59° F.), and in 0.8 part of boiling water; insoluble in alcohol.

When strongly heated, the crystals fuse, lose their water of crystallization, swell up, and finally leave a pale brown residue.

The aqueous solution of the salt has a slightly acid reaction, and yields with potassium ferrocyanide T.S. a blue precipitate; and with barium chloride T.S. a white precipitate insoluble in hydrochloric acid.

With potassium or sodium hydrate T.S. it yields a brownish-red precipitate, and if the mixture be heated, vapor of ammonia is evolved.

If all the iron be precipitated from a solution of the salt by treating it with an excess of potassium or sodium hydrate T.S., the resulting filtrate, when neutralized with hydrochloric acid, and then mixed with ammonia water, should not yield a white, gelatinous precipitate (absence of *aluminum*).

If 0.56 (0.5588) Gm. of the salt be dissolved in a glass-stoppered bottle (having a capacity of about 100 Cc.) in 15 Cc. of water and 2 Cc. of hydrochloric acid, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require not less than 11.6 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 1 per cent. of metallic iron).

FERRI ET AMMONII TARTRAS.

IRON AND AMMONIUM TARTRATE.

[AMMONIO-FERRIC TARTRATE.]

Solution of Ferric Sulphate, *one hundred cubic centimeters*. 100 Cc.
 Tartaric Acid, *twenty-nine grammes*..... 29 Gm.
 Distilled Water, *two hundred cubic centimeters* 200 Cc.
 Ammonia Water,
 Water, each, *a sufficient quantity*.

To *one hundred and ten* (110) *cubic centimeters* of Ammonia Water, previously diluted with *two hundred and fifty* (250) *cubic centimeters* of cold Water, add, with constant stirring, the Solution of Ferric Sulphate, previously diluted with *thirteen hundred* (1300) *cubic centimeters* of cold Water. When the precipitate has subsided, draw off the clear, supernatant liquid by means of a siphon, then mix the precipitate intimately with about *fifteen hundred* (1500) *cubic centimeters* of cold Water, again draw off the clear liquid, and repeat the washing with Water in the same manner until the decanted liquid gives not more than a slight cloudiness with barium chloride test-solution. Then transfer the precipitate to a wet muslin strainer, allow it to drain, and express the water as completely as possible. Dissolve one-half of the Tartaric Acid in the Distilled Water, neutralize the solution exactly with Ammonia Water, then add the other half of the Tartaric Acid, and dissolve it by the application of a gentle heat. Now add the moist ferric hydrate, in successive portions, stirring constantly, and continue the heat, which should not exceed 60° C. (140° F.), until the hydrate is dissolved. Filter the solution while hot, evaporate it in a porcelain vessel, at or below the above-mentioned temperature, to the consistence of syrup, and spread it on plates of glass, so that, when dry, the salt may be obtained in scales.

Keep the product in well-stoppered bottles, protected from light.

Thin, transparent scales, varying in color from garnet-red to reddish-brown, without odor, and having a sweetish, slightly ferruginous taste; slightly deliquescent in the air. Very soluble in water; insoluble in alcohol.

When strongly heated, the salt chars, emits fumes having an odor of burning sugar, and finally leaves a residue of ferric oxide, which should not have an alkaline reaction upon litmus paper (absence of *citrates* or *tartrates of the fixed alkalies*).

The aqueous solution of the salt is neutral to litmus paper, and is not precipitated, but rendered darker in color, by ammonia water.

With potassium ferrocyanide T.S. it does not afford a blue color or precipitate, unless it be acidulated with hydrochloric acid.

When heated with potassium or sodium hydrate T.S., it yields a brownish-red precipitate, and vapor of ammonia is evolved.

If a 10-per-cent. solution of the salt be deprived of its iron by boiling it with an excess of potassium or sodium hydrate T.S., the filtrate, when slightly acidulated with acetic acid, will gradually deposit a white, crystalline precipitate.

If 0.56 (0.5588) Gm. of the salt be dissolved in a glass-stoppered bottle (having a capacity of about 100 Cc.) in 15 Cc. of water and 2 Cc. of hydrochloric acid, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require about 17 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 1 per cent. of metallic iron).

FERRI ET POTASSII TARTRAS.

IRON AND POTASSIUM TARTRATE.

[POTASSIO-FERRIC TARTRATE.]

Solution of Ferric Sulphate, *one hundred cubic centimeters* 100 Cc.
 Potassium Bitartrate, *thirty-eight grammes* 38 Gm.
 Distilled Water, *three hundred cubic centimeters* 300 Cc.
 Ammonia Water,
 Water, each, *a sufficient quantity*.

To *one hundred and ten* (110) *cubic centimeters* of Ammonia Water, previously diluted with *two hundred and fifty* (250) *cubic centimeters* of cold Water, add, under constant stirring, the Solution of Ferric Sulphate, previously diluted with *thirteen hundred* (1300) *cubic centimeters* of cold Water. When the precipitate has subsided, draw off the clear, supernatant liquid by means of a siphon, then mix the precipitate intimately with about *fifteen hundred* (1500) *cubic centimeters* of cold Water, again draw off the clear liquid, and repeat the washing with Water in the same manner until the decanted liquid gives not more than a slight cloudiness with barium chloride test-solution. Then transfer the precipitate to a wet muslin strainer, allow it to drain, and express the water as completely as possible. Mix the Potassium Bitartrate with the Distilled Water in a porcelain vessel, heat the mixture, on a water-bath, to a temperature not exceeding 60° C. (140° F.), and gradually add the moist ferric hydrate, stirring constantly until it is dissolved. Filter the liquid while hot, and let the filtrate stand in a cool, dark place for twenty-four hours. Then stir it well with a porcelain or glass spatula, so that the precipitate which has formed in it may be thoroughly incorporated with the liquid. Now add, very cautiously, just enough Ammonia Water to dissolve the precipitate, evaporate the solution in a porcelain vessel, at or below the above-mentioned temperature, to the consistence of syrup, and spread it on plates of glass, so that, when dry, the salt may be obtained in scales.

Keep the product in well-stoppered bottles, protected from light.

Thin, transparent scales, varying in color from garnet-red to reddish-brown, without odor, and having a sweetish, slightly ferruginous taste; slightly deliquescent in the air.

Very soluble in water; insoluble in alcohol.

When strongly heated, the salt chars, emits fumes having an odor resembling that of burning sugar, and finally leaves a dark brown residue, having a strongly alkaline reaction, and effervescing with acids (distinction from *iron and ammonium tartrate*).

The aqueous solution of the salt is neutral to litmus paper, and is not precipitated, but rendered darker in color, by ammonia water.

With potassium ferrocyanide T.S. it does not afford a blue color or precipitate unless it be acidulated with hydrochloric acid.

When heated with potassium or sodium hydrate T.S., it yields a brownish-red precipitate, and a slight odor of ammonia is evolved.

If a 10-per-cent. solution of the salt be deprived of its iron by boiling it with an excess of potassium or sodium hydrate T.S., the filtrate, when slightly acidulated with acetic acid, will gradually deposit a white, crystalline precipitate.

If 0.56 (0.5588) Gm. of the salt be dissolved in a glass-stoppered bottle (having a capacity of about 100 Cc.) in 15 Cc. of water and 2 Cc. of hydrochloric acid, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require about 15 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 1 per cent. of metallic iron).

FERRI ET QUININÆ CITRAS.

IRON AND QUININE CITRATE.

Ferric Citrate, <i>eighty-five grammes</i>	85 Gm.
Quinine, dried at 100° C. (212° F.) to a constant weight, <i>twelve grammes</i>	12 Gm.
Citric Acid, <i>three grammes</i>	3 Gm.
Distilled Water, <i>a sufficient quantity</i> ,	
To make <i>one hundred grammes</i> . . .	100 Gm.

Dissolve the Ferric Citrate in *one hundred and sixty* (160) *cubic centimeters* of Distilled Water by heating on a water-bath at a temperature not exceeding 60° C. (140° F.). To this solution add the Quinine and Citric Acid, previously triturated with *twenty* (20) *cubic centimeters* of Distilled Water, and stir constantly until the Quinine and Citric Acid are dissolved. Lastly, evaporate the solution, on a water-bath, at a temperature not exceeding 60° C. (140° F.), to the consistence of syrup, and spread it on plates of glass, so that, when dry, the salt may be obtained in scales.

Keep the product in well-stoppered bottles, protected from light.

Thin, transparent scales, of a reddish-brown color, without odor, and having a bitter, mildly ferruginous taste; slowly deliquescent in damp air.

Slowly but completely soluble in cold water, more readily soluble in hot water, and but partially soluble in alcohol. Its solubility is diminished by age.

When strongly heated, the salt chars, and finally leaves a residue of ferric oxide, which should not have an alkaline reaction upon litmus paper (absence of *citrates* or *tartrates of the fixed alkalies*).

The aqueous solution of the salt has an acid reaction.

On the addition of a slight excess of ammonia water the color of the solution is deepened, and a white, curdy precipitate is produced.

The filtrate from this precipitate does not afford a blue color with potassium ferrocyanide T.S., unless it be acidulated with hydrochloric acid.

Another portion of the filtrate, treated with an excess of potassium or sodium hydrate T.S., deposits a brownish-red precipitate.

If a 10-per-cent. solution of the salt be deprived of its iron and quinine by boiling it with an excess of potassium or sodium hydrate T.S., and the filtrate slightly acidulated with acetic acid, a portion of the cooled liquid, mixed with a little calcium chloride T.S., and again heated to boiling, gradually deposits a white, crystalline precipitate.

Another portion of the acidulated and cooled liquid, when allowed to stand for some time, should not deposit a white, crystalline precipitate (absence of *tartrate*).

Estimation of the Quinine. Dissolve 1.12 (1.1176) Gm. of Iron and Quinine Citrate in a capsule, with the aid of a gentle heat, in 20 Cc. of water. Transfer the solution, together with the rinsings of the capsule, to a separator, allow the liquid to become cold, then add 5 Cc. of ammonia water and 10 Cc. of chloroform, and shake. Allow the liquids to separate, draw off the chloroform layer, and shake the residuary liquid a second and a third time with 10 Cc. of chloroform. Allow the combined chloroformic extracts to evaporate spontaneously in a tared capsule, and dry the residue at a temperature of 100° C. (212° F.) to a constant weight. This residue should weigh not less than 0.1288 Gm. (corresponding to at least 11.5 per cent. of dried quinine), and should conform to the reactions and tests of quinine (see *Quinina*).

Estimation of the Iron. Heat the aqueous liquid, from which the quinine has been removed in the manner just described, on a water-bath, until the odor of chloroform and ammonia has disappeared, allow it to cool, and dilute it with water to the volume of 50 Cc. Transfer 25 Cc. of the liquid to a glass-stoppered bottle (having the capacity of about 100 Cc.), add 2 Cc. of hydrochloric acid and 1 Gm. of potassium iodide, and allow the mixture to stand for half an hour at a temperature of 40° C. (104° F.). After it has been allowed to cool, and been mixed with a few drops of starch T.S., it should require about 14.5 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 1 per cent. of metallic iron).

FERRI ET QUININÆ CITRAS SOLUBILIS.

SOLUBLE IRON AND QUININE CITRATE.

Ferric Citrate, <i>eighty-five grammes</i>	85 Gm.
Quinine, dried at 100° C. (212° F.) to a constant weight, <i>twelve grammes</i>	12 Gm.
Citric Acid, <i>three grammes</i>	3 Gm.
Ammonia Water,	
Distilled Water, each, <i>a sufficient quantity</i> ,	

To make *one hundred grammes*. . . . 100 Gm.

Dissolve the Ferric Citrate in *one hundred and sixty* (160) *eubie centimeters* of Distilled Water, by heating on a water-bath at a temperature not exceeding 60° C. (140° F.). To this solution add the Quinine

and Citric Acid previously triturated with *twenty* (20) *cubic centimeters* of Distilled Water, and stir constantly until the Quinine and Citric Acid are dissolved. Then add gradually, and with constant stirring, *fifty* (50) *cubic centimeters*, or a *sufficient quantity*, of Ammonia Water, so that, after the addition of each portion of the latter, the precipitated Quinine will be redissolved and the liquid acquire a greenish-yellow tint. Lastly, evaporate the solution on a water-bath, at a temperature not exceeding 60° C. (140° F.), to the consistence of syrup, and spread it on plates of glass, so that, when dry, the salt may be obtained in scales.

Keep the product in well-stoppered bottles, protected from light.

Thin, transparent scales, of a greenish, golden-yellow color, without odor, and having a bitter, mildly ferruginous taste; deliquescent in damp air.

Rapidly and completely soluble in cold water, but only partially soluble in alcohol.

When strongly heated, the salt chars, and finally leaves a residue of ferric oxide, which should not have an alkaline reaction upon litmus paper (absence of *citrates* or *tartrates of the fixed alkalis*).

The aqueous solution of the salt has a slightly acid reaction.

On the addition of a slight excess of ammonia water the color of the liquid is deepened, and a white, curdy precipitate is produced.

If a portion of the filtrate from this precipitate be mixed with some potassium ferrocyanide T.S., it does not afford a blue color or precipitate, unless it be acidulated with hydrochloric acid.

Another portion of the filtrate, treated with an excess of potassium or sodium hydrate T.S., gives a brownish-red precipitate.

If a portion of the salt be heated with potassium or sodium hydrate T.S., vapor of ammonia will be evolved.

If a 10-per-cent. solution of the salt be deprived of its iron and quinine by boiling it with an excess of potassium or sodium hydrate T.S., and the filtrate slightly acidulated with acetic acid, a portion of the cooled liquid, mixed with a little calcium chloride T.S., and again heated to boiling, will gradually deposit a white, crystalline precipitate.

Another portion of the acidulated and cooled liquid, when allowed to stand for some time, should not give a white, crystalline precipitate (absence of *tartrate*).

Soluble Iron and Quinine Citrate, when assayed for Quinine and Iron by the method described under *Ferri et Quininæ Citras*, should respond to the requirements for the latter.

Preparation: Vinum Ferri Amarum.

FERRI ET STRYCHNINÆ CITRAS.

IRON AND STRYCHNINE CITRATE.

Iron and Ammonium Citrate, <i>ninety-eight grammes</i> . . .	98 Gm.
Strychnine, <i>one gramme</i>	1 Gm.
Citric Acid, <i>one gramme</i>	1 Gm.
Distilled Water, <i>one hundred and twenty cubic centimeters</i> . .	120 Cc.

To make *one hundred grammes* . . . 100 Gm.

Dissolve the Iron and Ammonium Citrate in *one hundred* (100) *cubic centimeters* of Distilled Water, and the Strychnine, together with the

Citric Acid, in *twenty (20) cubic centimeters* of Distilled Water. Mix the two solutions, evaporate the mixture by means of a water-bath, at a temperature not exceeding 60° C. (140° F.), to the consistence of syrup, and spread it on plates of glass, so that, when dry, the salt may be obtained in scales.

Keep the product in well-stoppered bottles, protected from light.

Thin, transparent scales, varying in color from garnet-red to yellowish-brown, without odor, and having a bitter, slightly ferruginous taste; deliquescent in damp air.

Readily and completely soluble in water, but only partly soluble in alcohol.

When strongly heated, the salt chars, and finally leaves a residue of ferric oxide which should not have an alkaline reaction upon litmus paper (absence of *citrates* or *tartrates* of the *fixed alkalies*).

The aqueous solution of the salt is slightly acid to litmus paper, and is not immediately precipitated, but rendered darker in color, by ammonia water.

With potassium ferrocyanide T.S. it does not yield a blue color or precipitate, unless it be acidulated with hydrochloric acid.

On heating it with potassium or sodium hydrate T.S., a brownish-red precipitate is produced, and vapor of ammonia evolved.

If a 10-per-cent. solution of the salt be deprived of its iron and strychnine by boiling it with an excess of potassium or sodium hydrate T.S., and the filtrate slightly acidulated with acetic acid, a portion of the cooled liquid, mixed with a little calcium chloride T.S., and again heated to boiling, will gradually deposit a white, crystalline precipitate.

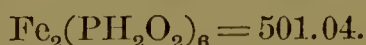
Another portion of the acidulated and cooled liquid, when allowed to stand for some time, should not deposit a white, crystalline precipitate (absence of *tartrate*).

Estimation of the Strychnine. Dissolve 2.24 (2.2352) Gm. of Iron and Strychnine Citrate, in a separator, in 15 Cc. of water, add 5 Cc. of ammonia water and 10 Cc. of chloroform, and shake. Allow the liquids to separate, draw off the chloroform layer, and shake the residuary liquid a second and a third time with 10 Cc. of chloroform. Allow the combined chloroformic extracts to evaporate spontaneously in a tared capsule, and dry the residue at a temperature of 100° C. (212° F.) to a constant weight. This residue should weigh not less than 0.02 Gm. nor more than 0.0224 Gm. (corresponding to not less than 0.9 nor more than 1 per cent. of strychnine), and should respond to the reactions and tests of strychnine (see *Strychnina*).

Estimation of the Iron. Heat the aqueous liquid, from which the strychnine has been removed in the manner just described, on a water-bath, until the odor of chloroform and ammonia has disappeared, allow it to cool, and dilute it with water to the volume of 100 Cc. Transfer 25 Cc. of the liquid to a glass-stoppered bottle (having the capacity of about 100 Cc.), add 2 Cc. of hydrochloric acid and 1 Gm. of potassium iodide, and allow the mixture to stand for half an hour, at a temperature of 40° C. (104° F.). After it has been allowed to cool, and been mixed with a few drops of starch T.S., it should require about 16 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 1 per cent. of metallic iron).

FERRI HYPOPHOSPHIS.

FERRIC HYPOPHOSPHITE.



Ferric Hypophosphite should be kept in well-stoppered bottles.

A white or grayish-white powder, odorless and nearly tasteless ; permanent in the air.

Only slightly soluble in water, more readily in presence of hypophosphorous acid, or in a warm, concentrated solution of an alkali citrate, forming with the latter a green solution.

When strongly heated in a dry test-tube, the salt evolves spontaneously inflammable hydrogen phosphide gas, and, on complete ignition, leaves a residue of ferric pyrophosphate.

The salt is readily oxidized by nitric acid or other oxidizing agents.

If to 0.5 Gm. of the salt 5 Cc. of acetic acid be added, no effervescence should occur (absence of *carbonate*), and if the mixture be subsequently heated to boiling, the filtrate, upon cooling, should afford no turbidity with ammonium oxalate T.S. (absence of *calcium*).

If 0.5 Gm. of the salt be boiled with 10 Cc. of potassium or sodium hydrate T.S., a reddish-brown precipitate will be produced ; and if to the filtrate from the latter, slightly acidulated with hydrochloric acid, magnesia mixture be added, and subsequently an excess of ammonia water, no crystalline precipitate should be produced (absence of *phosphate*).

If 0.1 Gm. of Ferric Hypophosphite be mixed with 10 Cc. of water, then 10 Cc. of diluted sulphuric acid and 50 Cc. of decinormal potassium permanganate V.S. added, and the mixture boiled for fifteen minutes, it should require not more than 3 Cc. of decinormal oxalic acid V.S. to discharge the red color (corresponding to at least 98.1 per cent. of the pure salt).

FERRI IODIDUM SACCHARATUM.

SACCHARATED FERROUS IODIDE.

Iron, in the form of fine, bright wire, and cut into small pieces, <i>six grammes</i>	6 Gm.
Reduced Iron, <i>one gramme</i>	1 Gm.
Iodine, <i>seventeen grammes</i>	17 Gm
Distilled Water,	
Sugar of Milk, recently dried, each, <i>a sufficient quantity</i> ,	
To make <i>one hundred grammes</i>	100 Gm.

Mix the Iron Wire, Iodine, and *twenty* (20) *cubic centimeters* of Distilled Water in a flask of thin glass, shake the mixture occasionally, until the reaction ceases, and the solution has acquired a green color and lost the smell of Iodine ; then filter it through a small, wetted filter into a porcelain capsule containing *forty* (40) *grammes* of Sugar of Milk. Rinse the flask and Iron Wire with a little Distilled Water, pass the rinsings through the filter into the capsule, and evaporate, on a water-bath, with frequent stirring, until a dry mass remains. Transfer this quickly to a heated iron mortar, reduce it to powder, and mix it intimately, by trituration, with the Reduced Iron and enough Sugar of Milk to make the final product weigh *one hundred* (100) *grammes*.

Transfer the powder at once to small and perfectly dry bottles, which should be securely stoppered, and kept in a cool and dark place.

A yellowish-white or grayish, very hygroscopic powder, without odor, and having a sweetish, ferruginous taste.

Soluble (with exception of the added reduced iron) in 7 parts of water at 15° C. (59° F.), but only partially soluble in alcohol.

When strongly heated, the compound swells up, evolves the odor of iodine and of burning sugar, and, on complete ignition, leaves a residue which should yield nothing soluble to water (absence of *salts of the fixed alkalies*).

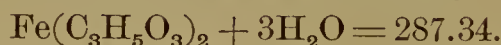
The aqueous solution has a slightly acid reaction, and gives with potassium ferricyanide T.S. a blue precipitate.

If the aqueous solution be mixed with a little starch T.S., and afterwards with a few drops of chlorine water, it will assume a deep blue color. This color should not be developed in the aqueous solution by starch T.S. alone (absence of *free iodine*).

If 1.55 (1.5447) Gm. of Saccharated Ferrous Iodide be dissolved in about 20 Cc. of water, in a small flask, and to this solution be successively added, first, 22 Cc. of decinormal silver nitrate V.S., then 5 Cc. of diluted nitric acid and 5 Cc. of ferric ammonium sulphate T.S., it should not require more than 2 Cc. of decinormal potassium sulphocyanate V.S. to produce a reddish-brown tint which persists after shaking (corresponding to about 20 per cent. of pure Ferrous Iodide).

FERRI LACTAS.

FERROUS LACTATE.



Ferrous Lactate should be kept in well-stoppered bottles.

Pale greenish-white crusts, consisting of small, needle-shaped crystals, having a slight, peculiar odor, and a mild, sweetish, ferruginous taste.

Slowly but completely soluble in 40 parts of water at 15° C. (59° F.), and in 12 parts of boiling water; freely soluble in a solution of an alkali citrate, yielding a green solution; almost insoluble in alcohol.

When strongly heated, the salt froths up, gives out dense, white, acrid fumes, chars, and finally leaves a brownish-red residue.

The aqueous solution of the salt has a greenish-yellow color, a slightly acid reaction, and gives with potassium ferricyanide T.S. a deep blue, and with potassium ferrocyanide T.S. a light blue, precipitate.

A 2-per-cent. aqueous solution of the salt should not afford with lead acetate T.S., nor, after acidulation with hydrochloric acid, with hydrogen sulphide T.S., more than a whitish opalescence (limit or absence of *sulphate, chloride, citrate, tartrate, malate, etc.*, and of *foreign metals*).

The aqueous solution, acidulated with nitric acid, should not afford more than a slight opalescence with barium chloride T.S., or with silver nitrate T.S. (limit of *sulphate or chloride*).

If 25 Cc. of the aqueous solution (1 in 50), mixed with 5 Cc. of diluted sulphuric acid, be boiled for a few minutes, then precipitated by an excess of potassium or sodium hydrate T.S., the filtrate, mixed with a few drops of alkaline cupric tartrate V.S., and heated to boiling, should not afford a red precipitate (absence of *sugar*).

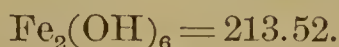
If a portion of the salt be triturated with strong sulphuric acid, no offensive odor should be developed (absence of *butyric acid*), nor should any gas be evolved (absence of *carbonate*), and the mixture, after standing for some time, should not assume a brown color (absence of *sugar, gum, or other readily carbonizable impurities*).

If 1 Gm. of the salt, contained in a porcelain crucible, be moistened with nitric acid, and carefully ignited, it should leave a residue of ferric oxide weighing not less than 0.270 nor more than 0.278 Gm. This residue should not have an alkaline reaction upon litmus paper, nor yield anything soluble to water (absence of *foreign salts*).

Preparation: Syrupus Hypophosphitum cum Ferro.

FERRI OXIDUM HYDRATUM.

FERRIC HYDRATE.



[FERRIC HYDROXIDE. HYDRATED OXIDE OF IRON.]

Solution of Ferric Sulphate, *one hundred cubic centimeters* 100 Cc.
 Ammonia Water, *one hundred and ten cubic centimeters* . . . 110 Cc.
 Water, *a sufficient quantity*.

To the Ammonia Water, previously diluted with *two hundred and fifty* (250) *cubic centimeters* of cold Water, add, under constant stirring, the Solution of Ferric Sulphate, previously diluted with *one thousand* (1000) *cubic centimeters* of cold Water. As soon as the precipitate has subsided, draw off the clear liquid by means of a siphon, then mix the precipitate intimately with about *one thousand* (1000) *cubic centimeters* of cold Water, again draw off the clear liquid after subsidence of the precipitate, and repeat this operation, until a portion of the decanted liquid gives not more than a slight cloudiness with barium chloride test-solution. Finally transfer the precipitate to a wet muslin strainer, and, after it has drained, mix it with sufficient cold Water to make the mixture weigh *two hundred and fifty* (250) *grammes*.

When Ferric Hydrate is to be made in haste, for use as an antidote, the washing may be performed more quickly, though less perfectly, by transferring the precipitate at once to a wet muslin strainer, pressing forcibly with the hands, until no more liquid passes, and then adding enough Water to make the whole weigh about *two hundred and fifty* (250) *grammes*.

NOTE.—The ingredients for preparing Ferric Hydrate as an antidote should always be kept on hand in bottles containing, respectively, *two hundred* (200) *cubic centimeters* of the Solution of Ferric Sulphate, and *two hundred and twenty* (220) *cubic centimeters* of Ammonia Water.

Ferric Hydrate, thus prepared, is a brownish-red magma, wholly soluble in hydrochloric acid without effervescence.

Preparations: Emplastrum Ferri. Trochisci Ferri.

FERRI OXIDUM HYDRATUM CUM
MAGNESIA.

FERRIC HYDRATE WITH MAGNESIA.

[ARSENIC ANTIDOTE.]

Solution of Ferric Sulphate, *fifty cubic centimeters* 50 Cc.
 Magnesia, *ten grammes*. 10 Gm.
 Water, *a sufficient quantity*.

Mix the Solution of Ferric Sulphate with *one hundred* (100) *cubic centimeters* of Water, and keep the liquid in a large, well-stoppered bottle. Rub the Magnesia with cold Water to a smooth and thin mixture, transfer this to a bottle capable of holding about *one thousand* (1000) *cubic centimeters*, and fill it with Water to about three-fourths of its capacity. When the preparation is wanted for use, shake the Magnesia mixture to a homogeneous, thin magma, gradually add to it the Iron Solution, and shake them together until a uniform, smooth mixture results.

NOTE.—The diluted Solution of Ferric Sulphate, and the mixture of Magnesia with Water, should always be kept on hand, ready for immediate use.

FERRI PHOSPHAS SOLUBILIS.

SOLUBLE FERRIC PHOSPHATE.

Ferric Citrate, <i>fifty grammes</i>	50 Gm.
Sodium Phosphate, uneffloresced, <i>fifty-five grammes</i>	55 Gm.
Distilled Water, <i>one hundred cubic centimeters</i>	100 Cc.

Dissolve the Ferric Citrate in the Distilled Water by heating on a water-bath. To this solution add the Sodium Phosphate, and stir constantly until it is dissolved. Evaporate the solution on a water-bath, at a temperature not exceeding 60° C. (140° F.), to the consistence of thick syrup, and spread it on plates of glass, so that, when dry, the salt may be obtained in scales.

Keep the product in dark amber-colored, well-stoppered bottles.

Thin, bright green, transparent scales, without odor, and having an acidulous, slightly saline taste. The salt is permanent in dry air when excluded from light, but becomes dark and discolored on exposure to light.

Freely and completely soluble in water, but insoluble in alcohol.

The aqueous solution of the salt has a slightly acid reaction.

With potassium ferrocyanide T.S. the solution gives a blue color, but does not yield a blue precipitate, unless it has been acidulated with hydrochloric acid.

If 1 Gm. of the salt be boiled with 10 Cc. of potassium or sodium hydrate T.S., a reddish-brown precipitate will be produced, and if the colorless filtrate from this precipitate be strongly acidulated with hydrochloric acid, then magnesia mixture added, and subsequently a slight excess of ammonia water, an abundant, white, crystalline precipitate will be produced.

If a portion of the filtrate from this precipitate be acidulated with acetic acid, and heated to boiling, no further precipitate should be produced (absence of *pyrophosphate*).

If 0.56 (0.5588) Gm. of the salt be dissolved in a glass-stoppered bottle (having a capacity of about 100 Cc.) in 15 Cc. of water and 2 Cc. of hydrochloric acid, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require about 12 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 1 per cent. of metallic iron).

Preparation: Syrupus Ferri, Quininae et Strychninae Phosphatum.

FERRI PYROPHOSPHAS SOLUBILIS.**SOLUBLE FERRIC PYROPHOSPHATE.**

Ferric Citrate, <i>fifty grammes</i>	50 Gm.
Sodium Pyrophosphate, <i>uneffloresced, fifty grammes</i> ...	50 Gm.
Distilled Water, <i>one hundred cubic centimeters</i>	100 Cc.

Dissolve the Ferric Citrate in the Distilled Water, by heating on a water-bath. To this solution add the Sodium Pyrophosphate, and stir constantly, until it is dissolved. Evaporate the solution, on a water-bath, at a temperature not exceeding 60° C. (140° F.), to the consistence of thick syrup, and spread it on plates of glass, so that, when dry, the salt may be obtained in scales.

Keep the product in dark amber-colored, well-stoppered bottles.

Thin, apple-green, transparent scales, without odor, and having an acidulous, slightly saline taste. The salt is permanent in dry air, when excluded from light, but becomes dark and discolored on exposure to light.

Freely and completely soluble in water, but insoluble in alcohol.

The aqueous solution of the salt has a slightly acid reaction.

With potassium ferrocyanide T.S. it gives a blue color, but does not yield a blue precipitate, unless it has been acidulated with hydrochloric acid.

If 1 Gm. of the salt be boiled with 10 Cc. of potassium or sodium hydrate T.S., a reddish-brown precipitate will be produced, and if the colorless filtrate from this precipitate be strongly acidulated with hydrochloric acid, then magnesia mixture added, and subsequently a slight excess of ammonia water, no precipitate should be produced (distinction from and absence of *ferric phosphate*).

If a portion of the filtrate be acidulated with acetic acid, and heated to boiling, an abundant, white, flocculent precipitate (pyrophosphate) will be produced.

If 0.56 (0.5588) Gm. of the salt be dissolved in a glass-stoppered bottle (having a capacity of about 100 Cc.) in 10 Cc. of water, then 10 Cc. of hydrochloric acid and subsequently 40 Cc. of water added, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require about 10 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 1 per cent. of metallic iron).

FERRI SULPHAS.**FERROUS SULPHATE.**

Ferrous Sulphate should be kept in well-stoppered bottles.

Large, pale bluish-green, monoclinic prisms, without odor, and having a saline, styptic taste; efflorescent in dry air. On exposure to moist air, the crystals rapidly absorb oxygen, and become coated with brownish-yellow, basic ferric sulphate.

Soluble in 1.8 parts of water at 15° C. (59° F.), and in 0.3 part of boiling water; insoluble in alcohol.

When slowly heated to 115° C. (239° F.), the crystals fall to powder, and lose 38.84 per cent. of their weight (6 molecules of water of crystallization).

The aqueous solution of the salt has an acid reaction, and, even when highly diluted, gives with potassium ferricyanide T.S. a blue color or precipitate, and with barium chloride T.S. a white precipitate insoluble in hydrochloric acid.

If 1 Gm. of the salt be dissolved in about 25 Cc. of water, the solution heated to boiling, oxidized with nitric acid, and then mixed with a slight excess of ammonia water, the filtrate from the reddish-brown precipitate should be colorless, and should not be affected by hydrogen sulphide T.S. (absence of copper, zinc, etc.).

If another portion of the filtrate be evaporated to dryness, and then ignited, it should not leave more than a trace of residue (limit of *salts of the fixed alkalies*).

If 1.39 (1.3871) Gm. of the salt be dissolved in about 25 Cc. of water, and the solution acidulated with sulphuric acid, not less than 50 Cc. of decinormal potassium permanganate V.S. should be required to impart to the liquid a permanent pink color (each Cc. of the volumetric solution indicating 2 per cent. of crystallized Ferrous Sulphate).

Preparations: Ferri Sulphas Exsiccatus. Ferri Sulphas Granulatus.

FERRI SULPHAS EXSICCATUS.

DRIED FERROUS SULPHATE.

Approximately $2\text{FeSO}_4 + 3\text{H}_2\text{O} = 357.28$.

Ferrous Sulphate, in coarse powder, *one hundred grammes* 100 Gm.

Allow the salt to effloresce at a temperature of about 40° C. (104° F.), and then heat it in a porcelain dish, on a water-bath, constantly stirring, until the product weighs from *sixty-four* (64) to *sixty-five* (65) *grammes*. Lastly, reduce the residue to a fine powder, and transfer it at once to perfectly dry, well-stoppered bottles.

A grayish-white powder, slowly but completely soluble in water, and conforming approximately to the reactions and tests given under *Ferri Sulphas*.

Preparation: Pilulæ Aloes et Ferri.

FERRI SULPHAS GRANULATUS.

GRANULATED FERROUS SULPHATE.

$\text{FeSO}_4 + 7\text{H}_2\text{O} = 277.42$.

[FERRI SULPHAS PRÆCIPITATUS, PHARM. 1880.]

Ferrous Sulphate, *one hundred grammes* 100 Gm

Distilled Water, *one hundred cubic centimeters* 100 Cc.

Diluted Sulphuric Acid, *five cubic centimeters* 5 Cc.

Alcohol, *twenty-five cubic centimeters* 25 Cc.

Dissolve the Ferrous Sulphate in the Distilled Water previously heated to boiling, add the Diluted Sulphuric Acid, and filter the solution while hot. Evaporate the solution immediately in a tared porcelain capsule, on a sand-bath, until it weighs *one hundred and fifty* (150) *grammes*, and then cool it quickly, under constant stirring. Transfer

the product to a glass funnel stopped with a plug of absorbent cotton, and, when it has thoroughly drained, pour upon it the Alcohol. When this also has drained, spread the crystalline powder on bibulous paper, dry it quickly in the sunlight, or in a dry room, at the ordinary temperature, and transfer it at once to perfectly dry, well-stoppered bottles.

Granulated Ferrous Sulphate is a very pale bluish-green, crystalline powder, which should conform in every respect to the reactions and tests given under *Ferri Sulphas*.

FERRI VALERIANAS.

FERRIC VALERIANATE.

Ferric Valerianate should be kept in small, well-stoppered bottles, in a cool and dark place.

A dark brick-red, amorphous powder of somewhat varying chemical composition, having the odor of valerianic acid, and a mildly styptic taste ; permanent in dry air.

Insoluble in cold water, but readily soluble in alcohol.

Boiling water decomposes it, setting free the valerianic acid, and leaving ferric hydrate. When slowly heated, the salt parts with its acid, without fusing, but, when rapidly heated, it fuses and gives off inflammable vapors having the odor of butyric acid, and, on complete ignition, leaves a residue of ferric oxide.

The stronger acids decompose the salt with the liberation of valerianic acid.

If 0.56 (0.5588) Gm. of the salt be dissolved in a glass-stoppered bottle (having a capacity of about 100 Cc.) in 2 Cc. of hydrochloric acid and 15 Cc. of water, and after the addition of 1 Gm. of potassium iodide the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require not less than 15 nor more than 20 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 1 per cent. of metallic iron).

FERRUM.

IRON.

Fe = 55.88.

Metallic Iron, in the form of fine, bright, and non-elastic wire.

FERRUM REDUCTUM.

REDUCED IRON.

A very fine, grayish-black, lustreless powder, without odor or taste ; permanent in dry air.

Insoluble in water or alcohol.

When treated with diluted sulphuric acid, it causes the evolution of nearly odorless hydrogen gas, which should not affect paper moistened with lead acetate T.S. (absence of *sulphide*), and, on applying a gentle heat, the Iron should dissolve in the acid without leaving more than 1 per cent. of residue.

When ignited, in contact with air, it glows and is converted into black ferroso-ferric oxide.

If 1 Gm. of Reduced Iron be shaken with 5 Cc. of water, the liquid should not change the color of litmus paper.

If 0.5 Gm. of Reduced Iron be added to 5 Cc. of arsenic-free hydrochloric acid, and the mixture be poured upon a filter while still effervescing, 1 Cc. of the clear filtrate should, after the addition of 2 Cc. of stannous chloride T.S. (see List of Reagents, Bettendorff's Test for Arsenic), together with a small piece of pure tin-foil, and gentle heating, show no brown coloration within half an hour (limit of *arsenic*).

Estimation of the Metallic Iron. Introduce 0.56 (0.559) Gm. of Reduced Iron into a glass-stoppered bottle, add 50 Cc. of mercuric chloride T.S., and heat the bottle, well stoppered, during one hour on a water-bath, frequently agitating. Then allow it to cool, dilute the contents with water to the volume of 100 Cc., and filter. To 10 Cc. of the filtrate, contained in a glass-stoppered bottle (having a capacity of about 100 Cc.), add 10 Cc. of diluted sulphuric acid, and subsequently decinormal potassium permanganate V.S., until a permanent red color is produced. The number of Cc. of the volumetric solution required, when multiplied by *ten* (10), will indicate the percentage of metallic iron.

To confirm the assay, decolorize the liquid by a few drops of alcohol, then add 1 Gm. of potassium iodide, and digest for half an hour at a temperature of 40° C. (104° F.). The cooled solution, mixed with a few drops of starch T.S., should require not less than 8 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color (each Cc. of the volumetric solution indicating 10 per cent. of metallic iron).

FICUS.

FIG.

The fleshy receptacle of *Ficus Carica* Linné (nat. ord. *Urticaceæ*), bearing fruit upon its inner surface.

Compressed, of irregular shape, fleshy, brownish or yellowish, covered with an efflorescence of sugar; of a sweet, fruity odor, and a very sweet, mucilaginous taste. When softened in water, figs are pear-shaped, with a scar or short stalk at the base, and a small, scaly orifice at the apex; hollow internally; the inner surface covered with numerous yellowish, hard achenes.

Preparation: Confectio Sennæ.

FŒNICULUM.

FENNEL.

The fruit of *Fœniculum capillaceum* Gilibert (nat. ord. *Umbelliferæ*).

Oblong, nearly cylindrical, slightly curved, from 4 to 8 Mm. long, brownish or greenish-brown; readily separable into the two prominent mericarps, each with five light brown, obtuse ribs, four oil-tubes on the back, and two or four oil-tubes upon the flat face; odor and taste aromatic, anise-like.

FRANGULA.

FRANGULA.

[BUCKTHORN.]

The bark of *Rhamnus Frangula* Linné (nat. ord. *Rhamnææ*), collected at least one year before being used.

Quilled, about 1 Mm. thick ; outer surface grayish-brown, or blackish-brown, with numerous small, whitish, transversely-elongated lenticels ; inner surface smooth, pale brownish-yellow ; fracture in the outer layer short, of a purplish tint ; in the inner layer fibrous and pale yellow ; when masticated, coloring the saliva yellow ; nearly inodorous ; taste sweetish and bitter.

Preparation : Extractum Frangulæ Fluidum.

GALLA.

NUTGALL.

An excrescence on *Quereus lusitanica* Lamarek (nat. ord. *Cupuliferæ*), caused by the punctures and deposited ova of *Cynips Gallæ tinctoriæ* Olivier (class *Insecta* ; order *Hymenoptera*).

Subglobular, 1 or 2 Cm. in diameter, more or less tuberculated above, otherwise smooth, heavy, hard ; often with a circular hole near the middle, communicating with the central cavity ; blackish olive-green or blackish-gray ; fracture granular, grayish ; in the center a cavity containing either the partly developed insect, or pulverulent remains left by it ; nearly inodorous, taste strongly astringent.

Light, spongy, and whitish-colored Nutgall should be rejected.

Preparations : Tinctura Gallæ. Unguentum Gallæ.

GELSEMIUM.

GELSEMIUM.

[YELLOW JASMINE.]

The rhizome and roots of *Gelsemium sempervirens* (Linné) Persoon (nat. ord. *Loganiaceæ*).

Cylindrical, long, or cut in sections, mostly from 5 to 15 Mm. and occasionally 3 Cm. thick, the roots much thinner ; externally light yellowish-brown, with purplish-brown, longitudinal lines ; tough ; fracture splintery ; bark thin, with silky bast-fibres, closely adhering to the pale yellowish, porous wood, which has fine, medullary rays, and in the rhizome a thin pith ; odor aromatic, heavy ; taste bitter.

Preparations : Extractum Gelsemii Fluidum. Tinctura Gelsemii.

GENTIANA.

GENTIAN.

The root of *Gentiana lutea* Linné (nat. ord. *Gentianeæ*).

In nearly cylindrical pieces or longitudinal slices, about 25 Mm. thick, the upper portion closely annulate, the lower portion longitudinally wrinkled ; externally deep yellowish-brown ; internally lighter ; somewhat flexible and tough when damp ; rather brittle when dry ; fracture uneven ; the bark rather thick, separated from the somewhat spongy medullium by a black cambium line ; odor peculiar, faint, more prominent when moistened ; taste sweetish and persistently bitter.

Preparations : Extractum Gentianæ. Extractum Gentianæ Fluidum. Tinctura Gentianæ Composita.

GERANIUM.

GERANIUM.

[CRANESBILL.]

The rhizome of *Geranium maculatum* Linné (nat. ord. *Geraniaceæ*).

Of horizontal growth, cylindrical, 5 to 7 Cm. long; about 1 Cm. thick; rather sharply tuberculated, longitudinally wrinkled, dark brown; fracture short, pale reddish-brown; bark thin; wood-wedges yellowish, small, forming a circle near the cambium line; medullary rays broad; central pith large; roots thin, fragile; inodorous; taste strongly astringent.

Preparation: Extractum Geranii Fluidum.

GLYCERINUM.

GLYCERIN.

A liquid obtained by the decomposition of vegetable or animal fats or fixed oils, and containing not less than 95 per cent. of absolute Glycerin [$C_3H_5(OH)_3 = 91.79$].

A clear, colorless liquid, of a thick, syrupy consistence, oily to the touch, odorless, very sweet and slightly warm to the taste. When exposed to the air, it slowly abstracts moisture.

Specific gravity: not less than 1.250 at 15° C. (59° F.).

Soluble, in all proportions, in water or alcohol; also soluble in a mixture of 3 parts of alcohol and 1 part of ether, but insoluble in ether, chloroform, carbon disulphide, benzin, benzol, and fixed or volatile oils.

Glycerin is slowly volatilized from an aqueous solution, at or above 100° C. (212° F.), with the vapor of water. Heated by itself to a higher temperature, it yields acrid decomposition products, boils at a temperature at or above 165° C. (329° F.), and is finally entirely decomposed and dissipated.

If a fused bead of borax, on a loop of platinum wire, be moistened with Glycerin, and then held in the non-luminous flame, the latter will be transiently tinted deep green.

An aqueous solution of Glycerin is neutral to litmus paper.

When a small portion of Glycerin is heated to boiling in an open porcelain or platinum capsule, and then gently ignited, it should burn and vaporize so as to leave not more than a dark stain (absence of *dextrin* and *sugar*, which would leave a bulky, difficultly combustible, charred mass); and on full combustion no residue whatever should be left (absence of *fixed impurities*).

If 5 Cc. of Glycerin be mixed with 50 Cc. of water and 10 drops of hydrochloric acid in a small flask, and heated for half an hour on a boiling water-bath, then 10 Cc. of the hot liquid mixed with 2 Cc. of sodium hydrate T.S. and 1 Cc. of alkaline cupric tartrate V.S., no yellowish-red cloudiness or precipitate should appear within six hours (absence of *sugars*).

On gently warming a mixture of equal volumes of Glycerin and of concentrated sulphuric acid in a test-tube, the liquid should not acquire a dark color (absence of *readily carbonizable impurities*).

On gradually heating 5 Cc. of Glycerin with 3 Cc. of diluted sulphuric acid in a test-tube, short of boiling, no offensive or acidulous odor should be evolved (absence of *fatty acids*, etc.).

No color, cloudiness, or precipitate should appear when separate portions of its aqueous solution (1 in 10) are treated with hydrogen sulphide or ammonium sulphide T.S. (absence of *metals*), barium chloride T.S. (*sulphuric acid*), calcium chloride T.S. (*oxalic acid*), or ammonium oxalate T.S. (*calcium salts*).

If a mixture of 2 Cc. of Glycerin with 10 Cc. of water, contained in a perfectly clean, glass-stoppered cylinder, be heated for five minutes in a water-bath at a temperature of 60°–65° C. (140°–149° F.), then mixed with 10 drops of silver nitrate T.S., and the cylinder set aside, well stoppered, in diffused daylight, no change of transparency or color should occur in the mixture within five minutes (absence of *chlorides*, and limit of *impurities having reducing properties*).

Preparation : Suppositoria Glycerini.

GLYCERITUM ACIDI CARBOLICI.

GLYCERITE OF CARBOLIC ACID.

Carbolic Acid, <i>twenty grammes</i>	20 Gm.
Glycerin, <i>eighty grammes</i>	80 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Weigh the Carbolic Acid and Glycerin, successively, into a tared capsule, and stir them together until the Acid is dissolved. Then transfer the solution to a bottle.

GLYCERITUM ACIDI TANNICI.

GLYCERITE OF TANNIC ACID.

Tannic Acid, <i>twenty grammes</i>	20 Gm.
Glycerin, <i>eighty grammes</i>	80 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Weigh the Tannic Acid and Glycerin, successively, into a tared porcelain capsule, avoiding contact with metallic utensils, and apply the heat of a water-bath, until the Acid is completely dissolved. Then transfer the solution to a bottle.

GLYCERITUM AMYLI.

GLYCERITE OF STARCH.

Starch, <i>ten grammes</i>	10 Gm.
Water, <i>ten cubic centimeters</i>	10 Cc.
Glycerin, <i>eighty grammes</i>	80 Gm.

To the Starch, contained in a porcelain capsule, add the Water and Glycerin, and stir until a homogeneous mixture is produced. Then apply a heat gradually raised to 140° C. (284° F.), and not exceeding 144° C. (291.2° F.), stirring constantly, until a translucent jelly is formed. Transfer the product to suitable vessels, provided with well-fitting covers.

GLYCERITUM BOROGLYCERINI.

GLYCERITE OF BOROGLYCERIN.

[GLYCERITE OF GLYCERYL BORATE. SOLUTION OF BOROGLYCERIDE.]

Boric Acid, in fine powder, *three hundred and ten grammes* 310 Gm.
Glycerin, *a sufficient quantity*,

To make *one thousand grammes* 1000 Gm.

Heat *four hundred and sixty* (460) *grammes* of Glycerin, in a tared porcelain capsule, to a temperature not exceeding 150° C. (302° F.), and add the Boric Acid in portions, constantly stirring. When all is added and dissolved, continue the heat at the same temperature, frequently stirring, and breaking up the film which forms on the surface. When the mixture has been reduced to the weight of *five hundred* (500) *grammes*, add to it *five hundred* (500) *grammes* of Glycerin, mix thoroughly, and transfer it to suitable vessels.

GLYCERITUM HYDRASTIS.

GLYCERITE OF HYDRASTIS.

Hydrastis, in No. 60 powder, *one thousand grammes* 1000 Gm.

Glycerin, *five hundred cubic centimeters* 500 Cc.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the Hydrastis with *three hundred and fifty* (350) *cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol until the Hydrastis is practically exhausted. To the percolate add *two hundred and fifty* (250) *cubic centimeters* of Water, and then drive off the Alcohol by evaporation or distillation. After the Alcohol is driven off, add enough Water to the residue to make it measure *five hundred* (500) *cubic centimeters*, and set it aside for twenty-four hours. Then filter, pass enough Water through the filter to make the filtrate measure *five hundred* (500) *cubic centimeters*, add the Glycerin, and mix thoroughly.

GLYCERITUM VITELLI.**GLYCERITE OF YOLK OF EGG.**

[GLYCONIN.]

Fresh Yolk of Egg, <i>forty-five grammes</i>	45 Gm.
Glycerin, <i>fifty-five grammes</i>	55 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Rub the Yolk of Egg, in a mortar, with the Glycerin, gradually added, until they are thoroughly mixed. Then transfer the mixture to a bottle.

GLYCYRRHIZA.**GLYCYRRHIZA.**

[LIQUORICE ROOT.]

The root of *Glycyrrhiza glabra* Linné, and of the variety *glandulifera* (Waldstein et Kittabel) Regel et Herder (nat. ord. *Leguminosæ*).

In long, cylindrical pieces, from 5 to 25 Mm. thick, longitudinally wrinkled, externally grayish-brown, warty; internally tawny-yellow; pliable, tough; fracture coarsely fibrous; bark rather thick; wood porous, but dense, in narrow wedges; medullary rays linear; taste sweet, somewhat acrid.

The underground stem, which is often present, has the same appearance, but contains a thin pith.

The drug derived from the variety *glandulifera* (so-called Russian Liquorice) consists usually of roots or root-branches, 1 to 4 Cm. thick, 15 to 30 Cm. long, frequently deprived of the corky layer, the wood rather soft, and usually more or less cleft.

Preparations: Extractum Glycyrrhizæ Fluidum. Extractum Glycyrrhizæ Purum. Glycyrrhizinum Ammoniatum. Pulvis Glycyrrhizæ Compositus.

GLYCYRRHIZINUM AMMONIATUM.**AMMONIATED GLYCYRRHIZIN.**

Glycyrrhiza, in No. 20 powder, *five hundred grammes* 500 Gm.

Water,

Ammonia Water,

Sulphuric Acid, each, *a sufficient quantity*.

Mix *four hundred and seventy-five* (475) *cubic centimeters* of Water with *twenty-five* (25) *cubic centimeters* of Ammonia Water, and, having moistened the powder with the mixture, macerate for twenty-four hours. Then pack it moderately in a conical glass percolator, and gradually pour Water upon it until *five hundred* (500) *cubic centimeters* of percolate are obtained. Add Sulphuric Acid slowly to the percolate, with constant stirring, so long as a precipitate is produced. Collect this on a strainer, wash it with cold Water until the washings

no longer have an acid reaction, redissolve it in Water with the aid of Ammonia Water, filter, if necessary, and again add Sulphuric Acid so long as a precipitate is produced. Collect this, wash it, dissolve it in a sufficient quantity of Ammonia Water previously diluted with an equal volume of Water, and spread the clear solution upon plates of glass, so that, when dry, the product may be obtained in scales.

Dark brown or brownish-red scales, without odor, and having a very sweet taste.

Readily soluble in water and in alcohol.

The aqueous solution, when heated with potassium or sodium hydrate T.S., evolves ammoniacal vapors.

If the aqueous solution be supersaturated with an acid, there will be produced a precipitate (glycyrrhizin) which, when dissolved in hot water, forms a jelly on cooling. This substance, after being washed with diluted alcohol, and dried, appears as an amorphous, yellow powder, having a strong, bitter-sweet taste, and an acid reaction.

Upon incineration, Ammoniated Glycyrrhizin should not leave more than a trace of ash.

GOSSYPII RADICIS CORTEX.

COTTON ROOT BARK.

The bark of the root of *Gossypium herbaceum* Linné, and of other species of *Gossypium* (nat. ord. *Malvaceæ*).

In thin, flexible bands or quilled pieces; outer surface brownish-yellow, with slight, longitudinal ridges or meshes, small, black, circular dots, or short, transverse lines, and dull, brownish-orange patches, from the abrasion of the thin cork; inner surface whitish, of a silky lustre, finely striate; bast-fibres long, tough, and separable into papery layers; inodorous; taste very slightly acid and faintly astringent.

Preparation: Extractum Gossypii Radicis Fluidum.

GOSSYPIUM PURIFICATUM.

PURIFIED COTTON.

[GOSSYPIUM, PHARM. 1880. ABSORBENT COTTON.]

The hairs of the seed of *Gossypium herbaceum* Linné, and of other species of *Gossypium* (nat. ord. *Malvaceæ*), freed from adhering impurities, and deprived of fatty matter.

White, soft, fine filaments, appearing under the microscope as hollow, flattened and twisted bands, spirally striate, and slightly thickened at the edges; inodorous and tasteless; insoluble in ordinary solvents, but soluble in copper ammonium sulphate solution.

Purified Cotton should be perfectly free from all visible impurities, and, on combustion, should not leave more than 0.8 per cent. of ash.

When Purified Cotton, previously compressed in the hand, is thrown on the surface of cold water, it should readily absorb the latter and sink, and the water should not acquire either an acid or an alkaline reaction (evidence of proper purification).

Preparation: Pyroxylinum.

GRANATUM.**POMEGRANATE.**

The bark of the stem and root of *Punica Granatum* Linné (nat. ord. *Lythraricæ*).

In thin quills or fragments, from 5 to 10 Cm. long, and from 1 to 3 Mm. thick; outer surface yellowish-gray, somewhat warty, or longitudinally and reticulately ridged; the stem-bark often partly covered with blackish lichens; the thicker pieces of the root-bark more or less scaly externally; inner surface smooth, finely striate, grayish-yellow; fracture short, granular, greenish-yellow; indistinctly radiate; inodorous; taste astringent; very slightly bitter.

GRINDELIA.**GRINDELIA.**

The leaves and flowering tops of *Grindelia robusta* Nuttall, and of *Grindelia squarrosa* Dunal (nat. ord. *Compositæ*).

Leaves about 5 Cm. or less long, varying from broadly spatulate or oblong to lanceolate, sessile or clasping, obtuse, more or less sharply serrate, often spinosely toothed, or even laciniate-pinnatifid, pale green, smooth, finely dotted, thickish, brittle; heads many-flowered, subglobular or somewhat conical; the involucre hemispherical, about 10 Mm. broad, composed of numerous imbricated, squarrosely-tipped or spreading scales; ray-florets yellow, ligulate, pistillate; disk-florets yellow, tubular, perfect; pappus consisting of two or three awns of the length of the disk-florets; odor balsamic; taste pungently aromatic and bitter.

Preparation: Extractum Grindeliæ Fluidum.

GUAIACI LIGNUM.**GUAIAECUM WOOD.**

The heart-wood of *Guaiacum officinale* Linné, and of *Guaiacum sanctum* Linné (nat. ord. *Zygophylleæ*).

Heavier than water, hard, brown or greenish-brown, resinous, marked with irregular, concentric circles, surrounded by a yellowish alburnum, splitting irregularly; when heated, emitting a balsamic odor; taste slightly acid.

Guaiacum Wood is generally used in the form of raspings or turnings, which should be greenish-brown, containing few particles of a whitish color, and should acquire a dark bluish-green color on the addition of nitric acid.

GUAIACI RESINA.**GUAIAEC.**

The resin of the wood of *Guaiacum officinale* Linné (nat. ord. *Zygophylleæ*).

In irregular masses, or subglobular pieces, externally greenish-brown, internally of a glassy lustre, and, in recent Guaiac, usually reddish-brown,

transparent in thin splinters, fusible, feebly aromatic, the odor becoming stronger on heating; taste somewhat acrid; powder grayish, turning green on exposure to air.

Soluble in potassium or sodium hydrate T.S. and in alcohol; the alcoholic solution is colored blue on the addition of tincture of ferric chloride.

Preparations: *Pilulæ Antimonii Compositæ*. *Tinctura Guaiaci*. *Tinctura Guaiaci Ammoniata*.

GUARANA.

GUARANA.

A dried paste chiefly consisting of the crushed or pounded seeds of *Paullinia Cupana* Kunth (*Paullinia sorbilis* Martius; nat. ord. *Sapindaceæ*).

Subglobular or elliptic cakes, or cylindrical sticks, hard, dark reddish-brown; fracture uneven, somewhat glossy, pale reddish-brown, showing fragments of seeds invested with blackish-brown integuments; odor slight, peculiar, resembling that of chocolate; taste astringent and bitter.

It is partly soluble in water, and in alcohol.

Preparation: *Extractum Guaranae Fluidum*.

HÆMATOXYLON.

HÆMATOXYLON.

[LOGWOOD.]

The heart-wood of *Hæmatoxylon campechianum* Linné (nat. ord. *Leguminosæ*).

Heavy, hard, externally purplish-black, internally brownish-red, and marked with irregular, concentric circles, splitting irregularly; odor faint, agreeable; taste sweetish, astringent. When chewed, it colors the saliva dark pink.

Logwood is generally met with in the form of small chips or coarse powder of a dark brownish-red color, often with a greenish lustre.

Preparation: *Extractum Hæmatoxyli*.

HAMAMELIS.

HAMAMELIS.

[WITCHHAZEL.]

The leaves of *Hamamelis virginiana* Linné (nat. ord. *Hamamelaceæ*), collected in autumn.

Short-petiolate, about 10 Cm. long, obovate or oval, slightly heart-shaped and oblique at the base, sinuate-toothed, thickish, nearly smooth; inodorous; taste astringent and bitter.

Preparation: *Extractum Hamamelidis Fluidum*.

HEDEOMA.**HEDEOMA.**

[PENNYROYAL.]

The leaves and tops of *Hedeoma pulegioides* (Linné) Persoon (nat. ord. *Labiatae*).

Leaves opposite, short-petioled, about 12 Mm. long, oblong-ovate, obscurely serrate, glandular beneath; branches roundish-quadrangular, hairy; flowers in small, axillary cymules, with a tubular-ovoid, bilabiate and five-toothed calyx, and a pale blue, spotted, bilabiate corolla, containing two sterile and two fertile, exserted stamens; odor strong, mint-like; taste warm and pungent.

HUMULUS.**HOPS.**

The strobiles of *Humulus Lupulus* Linné (nat. ord. *Urticaceae*).

Ovate, about 3 Cm. long, consisting of a thin, hairy, undulated axis, and many obliquely ovate, membranous scales, in the upper part reticulately veined, and towards the base parallel-veined, glandular, and surrounding a subglobular achene; color of the scales greenish, free from reddish or brownish spots; odor aromatic; taste bitter, aromatic and slightly astringent.

Preparation: Tinctura Humuli.

HYDRARGYRI CHLORIDUM CORROSIVUM.**CORROSIVE MERCURIC CHLORIDE.**

[CORROSIVE CHLORIDE OF MERCURY. CORROSIVE SUBLIMATE.]

Corrosive Mercuric Chloride should be kept in well-stoppered bottles.

Heavy, colorless, rhombic crystals, or crystalline masses, odorless, and having an acrid and persistent, metallic taste; permanent in the air.

Soluble, at 15° C. (59° F.), in 16 parts of water, and in 3 parts of alcohol; in 2 parts of boiling water, 1.2 parts of boiling alcohol, 4 parts of ether, and about 14 parts of glycerin.

It fuses at 265° C. (509° F.) to a colorless liquid, and at about 300° C. (572° F.) it volatilizes in dense, white vapors, leaving no residue.

The aqueous solution reddens blue litmus paper, but becomes neutral to litmus on the addition of sodium chloride.

With ammonia water it yields a white precipitate; with an excess of hydrogen sulphide a black one; with potassium iodide T.S. a red one, soluble in an excess of the reagent; and with silver nitrate T.S. a white precipitate, insoluble in nitric acid.

If a saturated, aqueous solution of the salt be heated nearly to boiling, then completely saturated with hydrogen sulphide, and allowed to stand for several hours in a well-corked flask, it should yield a colorless filtrate which, on evaporation, should leave no residue (absence of many foreign salts).

If the precipitated mercuric sulphide obtained in the last test be washed with water, then shaken for a few minutes with ammonia water, and filtered, the filtrate should be colorless, and, on the addition of a slight excess of hydrochloric acid, should afford neither a yellow color, nor a yellow precipitate (absence of *arsenic*).

HYDRARGYRI CHLORIDUM MITE.

MILD MERCUROUS CHLORIDE.



[CALOMEL. MILD CHLORIDE OF MERCURY.]

Obtained in the form of powder by the rapid condensation of the vapor of Mercurous Chloride.

Mild Mercurous Chloride should be kept in dark amber-colored bottles.

A white, impalpable powder, becoming yellowish-white on being triturated with strong pressure, and showing only small, isolated crystals under a magnifying power of one hundred diameters. It is odorless and tasteless, and permanent in the air.

Insoluble in water, alcohol, or ether, and also in cold, dilute acids.

When strongly heated, it is wholly volatilized, without melting.

In contact with calcium hydrate T.S., or with solutions of alkali hydrates, or with ammonia water, the salt is blackened.

When heated with dried sodium carbonate in a dry glass tube, it yields metallic mercury.

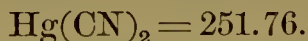
If 1 Gm. of the salt be shaken with 10 Cc. of water or alcohol, the respective filtrates should not be affected by hydrogen sulphide T.S. or silver nitrate T.S. (absence of *mercuric chloride*), nor should they leave any residue on evaporation (absence of *other soluble impurities*).

On heating a portion of the salt, in a test-tube, with potassium or sodium hydrate T.S., it should not evolve the odor of ammonia; and if another portion be shaken with acetic acid, the filtrate should not be affected by hydrogen sulphide T.S., nor by silver nitrate T.S. (distinction from and absence of *ammoniated mercury*).

Preparations: Pilulæ Antimonii Compositæ. Pilulæ Catharticæ Compositæ.

HYDRARGYRI CYANIDUM.

MERCURIC CYANIDE.



Mercuric Cyanide should be kept in well-stoppered, dark amber-colored bottles.

Colorless or white, prismatic crystals, odorless, and having a bitter, metallic taste (the salt is exceedingly poisonous). Becoming dark-colored on exposure to light.

Soluble, at 15° C. (59° F.), in 12.8 parts of water, and in 15 parts of alcohol; in 3 parts of boiling water, and in 6 parts of boiling alcohol; very sparingly soluble in ether.

When slowly heated in a glass tube, the salt decrepitates, and decomposes into metallic mercury and inflammable cyanogen gas, which burns with a

purple flame. On further heating, the blackish residue, consisting of paracyanogen with globules of metallic mercury, is wholly dissipated.

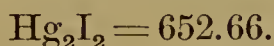
If 1 part of the salt be gently heated with 1 part of iodine in a dry test-tube, it will afford at first a yellow sublimate which afterwards becomes red, and above this a sublimate of colorless, needle-shaped crystals will be formed.

On adding hydrochloric acid to the aqueous solution of the salt, the odor of hydrocyanic acid is evolved.

A 5-per-cent. aqueous solution of the salt should be neutral to litmus paper, and should not yield, on the gradual addition of a few drops of potassium iodide T.S., either a red or a reddish precipitate, soluble in an excess of the precipitant, nor should it yield a white precipitate with silver nitrate T.S. (absence of *mercuric chloride*).

HYDRARGYRI IODIDUM FLAVUM.

YELLOW MERCUROUS IODIDE.



[HYDRARGYRI IODIDUM VIRIDE, PHARM. 1880.—PROTIODIDE OF MERCURY. YELLOW (OR GREEN) IODIDE OF MERCURY.]

Mercury, *fifty grammes*..... 50 Gm.

Nitric Acid,

Potassium Iodide,

Distilled Water,

Alcohol, each, *a sufficient quantity*.

Mix *twenty* (20) *cubic centimeters*, each, of Nitric Acid and Distilled Water, and, when the liquid is cold, pour it upon the mercury contained in a small glass flask. Set the mixture aside in a cool and dark place, and agitate it occasionally, until the reaction ceases, and a little mercury still remains undissolved. Separate the crystals of mercurous nitrate, which will have formed, from the mother-liquid, allow them to drain in a glass funnel, and dry them on bibulous paper, in a dark place. When the salt is dry, weigh off *forty* (40) *grammes* of it, and dissolve it in *one thousand* (1000) *cubic centimeters* of Distilled Water to which *ten* (10) *cubic centimeters* of Nitric Acid had previously been added. Having prepared a solution of *twenty-four* (24) *grammes* of Potassium Iodide in *one thousand* (1000) *cubic centimeters* of Distilled Water, slowly pour the solution of Potassium Iodide into that of the Mercurous Nitrate, with constant stirring, allow the precipitate to subside, decant the supernatant liquid, and transfer the precipitate, together with the remainder of the liquid, to a filter. When the precipitate has drained, wash it with Distilled Water until the washings no longer have an acid reaction upon litmus paper, and afterwards wash it with Alcohol, as long as the clear, colorless washings give any color with hydrogen sulphide test-solution. Lastly, dry the

product in a dark place, between sheets of bibulous paper, at a temperature not exceeding 40° C. (104° F.). Keep it in dark amber-colored vials, with the least possible exposure to light.

Instead of weighing off *forty* (40) *grammes* of the Mercurous Nitrate as above directed, the whole of the crystallized salt may be taken and the amount of Potassium Iodide, etc., adjusted on the proportions given above.

A bright yellow, amorphous powder, odorless and tasteless. By exposure to light it becomes darker, in proportion as it undergoes decomposition into metallic mercury and mercuric iodide.

Almost insoluble in water, and wholly insoluble in alcohol or ether.

When slowly and moderately heated, it assumes at first an orange and then a red color, becoming yellow again on cooling. When quickly and strongly heated, it is at first partially decomposed into mercury and mercuric iodide, and finally is completely volatilized.

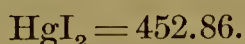
When it is heated with sulphuric acid and a little manganese dioxide, vapor of iodine is evolved.

In contact with a solution of potassium iodide, the salt is decomposed into mercuric iodide, which dissolves, leaving a residue of metallic mercury.

If 0.5 Gm. of the salt be shaken with 10 Cc. of alcohol, a portion of the filtrate should be scarcely affected by hydrogen sulphide T.S., nor should it produce more than a very faint, transient opalescence when dropped into water; and if 5 Cc. of the filtrate be evaporated from a white porcelain surface, not more than a very faint, red stain should remain (absence of more than traces of *mercuric iodide*).

HYDRARGYRI IODIDUM RUBRUM.

RED MERCURIC IODIDE.



[BINIODIDE OF MERCURY. RED IODIDE OF MERCURY.]

Corrosive Mercuric Chloride, <i>forty grammes</i>	40 Gm.
Potassium Iodide, <i>fifty grammes</i>	50 Gm.
Distilled Water, <i>a sufficient quantity</i> .	

Dissolve the Corrosive Mercuric Chloride and the Potassium Iodide, each, in *eight hundred* (800) *cubic centimeters* of Distilled Water, and filter the solutions separately. Pour both solutions, simultaneously and in a thin stream, under constant and very active stirring, into *two thousand* (2000) *cubic centimeters* of Distilled Water. When the precipitate has subsided, decant the supernatant liquid, collect the precipitate on a filter, and wash it with cold Distilled Water, until the washings give not more than a slight opalescence with silver nitrate test-solution. Finally, dry it in a dark place, between sheets of bibulous paper, at a temperature not exceeding 40° C. (104° F.).

Keep the product in well-stoppered bottles, protected from light.

A scarlet-red, amorphous powder, odorless and tasteless ; permanent in the air.

Almost insoluble in water, but soluble in 130 parts of alcohol at 15° C. (59° F.), and in 15 parts of boiling alcohol ; also soluble in a solution of potassium iodide, or of mercuric chloride, and in a solution of sodium hyposulphite.

When heated to about 150° C. (302° F.), the salt becomes yellow, but again assumes a red color on cooling ; at 238° C. (400.4° F.) it fuses to a dark yellow liquid, which, on cooling, forms a yellow, crystalline mass, and, at higher temperatures, volatilizes without decomposition, leaving no residue.

On heating the salt with potassium or sodium hydrate T.S., and adding a little sugar of milk, metallic mercury is precipitated.

When it is heated with sulphuric acid and a little manganese dioxide, vapor of iodine is evolved.

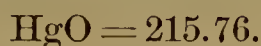
If the salt be dissolved in hot alcohol, the solution, after cooling, should be colorless ; and when this solution is diluted with an equal volume of water, it should not redden blue litmus paper (absence of *mercuric chloride*).

If about 0.5 Gm. of the salt be shaken with 10 Cc. of water, the filtered liquid should not become more than very slightly colored by hydrogen sulphide T.S., nor give more than a slight opalescence with silver nitrate T.S. (limit of *soluble chlorides* or *iodides*).

Preparation : Liquor Arseni et Hydrargyri Iodidi.

HYDRARGYRI OXIDUM FLAVUM.

YELLOW MERCURIC OXIDE.



Corrosive Mercuric Chloride, *one hundred grammes* 100 Gm.

Soda, *forty grammes* 40 Gm.

Distilled Water, *a sufficient quantity*.

Dissolve the Corrosive Mercuric Chloride in *one thousand* (1000) *cubic centimeters* of warm Distilled Water, and filter the solution. Dissolve the Soda (which should contain 90 per cent. of sodium hydrate) in *one thousand* (1000) *cubic centimeters* of cold Distilled Water, and into this solution pour gradually, and with constant stirring, the solution of Corrosive Mercuric Chloride. Allow the mixture to stand for an hour at a temperature of about 30° C. (86° F.), stirring frequently. Then decant the supernatant, clear liquid from the precipitate, and wash the latter repeatedly by the affusion and decantation of Distilled Water, using *one thousand* (1000) *cubic centimeters* of Water each time. Collect the precipitate on a strainer, and continue the washing with warm Distilled Water, until a small portion of the washings, when poured on a little mercuric chloride test-solution, no longer produces a yellowish turbidity at the line of contact of the two liquids. Then allow the precipitate to drain, and dry it between sheets of bibulous paper, in a dark place, at a temperature not exceeding 30° C. (86° F.).

Keep the product in well-stoppered bottles, protected from light.

A light orange-yellow, amorphous, heavy, impalpable powder, odorless, and having a somewhat metallic taste; permanent in the air, but turning darker on exposure to light.

Almost insoluble in water, insoluble in alcohol, but readily and completely soluble in diluted hydrochloric or nitric acid, forming colorless solutions.

When moderately heated, the Oxide assumes a red color. At a red heat it is completely decomposed into oxygen and metallic mercury, and is finally volatilized, leaving no residue.

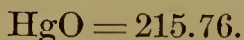
If 0.5 Gm. of the Oxide be digested on a water-bath, for fifteen minutes, with a solution of 1 Gm. of oxalic acid in 10 Cc. of water, it will be converted into white mercuric oxalate (distinction from *red mercuric oxide*).

On dissolving 1 Gm. of the Oxide in 100 Cc. of diluted nitric acid, the resulting solution should be clear, and should not afford more than a slight opalescence with silver nitrate T.S. (limit of *chloride*).

Preparation: Unguentum Hydrargyri Oxidi Flavi.

HYDRARGYRI OXIDUM RUBRUM.

RED MERCURIC OXIDE.



[RED PRECIPITATE.]

Red Mercuric Oxide should be kept in well-stoppered bottles, protected from light.

Heavy, orange-red, crystalline scales, or a crystalline powder, becoming more yellow the finer it is divided, odorless, and having a somewhat metallic taste; permanent in the air.

Almost insoluble in water, insoluble in alcohol, but readily and completely soluble in diluted hydrochloric or nitric acid, forming colorless solutions.

When heated to about 400° C. (752° F.), it becomes dark violet or almost black, but assumes its original color on cooling. At a red heat it is completely decomposed into oxygen and metallic mercury, and is finally volatilized, leaving no residue.

If 0.5 Gm. of the Oxide be digested, on a water-bath, with a solution of 1 Gm. of oxalic acid in 10 Cc. of water, it will not change color within two hours (distinction from *yellow mercuric oxide*).

If a little of the Oxide be strongly heated in a test-tube, the vapors should not redden moistened blue litmus paper (absence of *nitrate*).

On dissolving 1 Gm. of the Oxide in 100 Cc. of diluted nitric acid, the resulting solution should be clear, and should not afford more than a slight opalescence with silver nitrate T.S. (limit of *chloride*).

Preparation: Unguentum Hydrargyri Oxidi Rubri.

HYDRARGYRI SUBSULPHAS FLAVUS.

YELLOW MERCURIC SUBSULPHATE.



[BASIC MERCURIC SULPHATE. TURPETH MINERAL.]

Mercury, one hundred grammes.	100 Gm.
Sulphuric Acid, thirty cubic centimeters	30 Cc.
Nitric Acid, twenty-five cubic centimeters	25 Cc.
Distilled Water, a sufficient quantity.	

Upon the Mercury, contained in a capacious flask, pour the Sulphuric Acid, previously mixed with *fifteen* (15) *cubic centimeters* of Distilled Water, then add, very gradually, the Nitric Acid, previously mixed with *twenty-five* (25) *cubic centimeters* of Distilled Water, and digest at a gentle heat until reddish fumes are no longer given off. Transfer the mixture to a porcelain capsule, and heat it on a sand-bath, under a hood or in the open air, with frequent stirring, until a dry, white mass remains. Reduce this to a fine powder, and add it in small portions at a time, with constant stirring, to *two thousand* (2000) *cubic centimeters* of boiling Distilled Water. When all has been added, continue the boiling for ten minutes; then allow the mixture to settle, decant the supernatant liquid, transfer the precipitate to a strainer, wash it with warm Distilled Water, until the washings no longer have an acid reaction, and dry it in a moderately warm place.

Keep the product in well-stoppered bottles, protected from light.

A heavy, lemon-yellow powder, odorless and almost tasteless; permanent in the air.

Soluble in about 2000 parts of water at 15° C. (59° F.), and in 600 parts of boiling water; insoluble in alcohol; readily soluble in nitric or hydrochloric acid.

When heated, the salt turns red, becoming yellow again on cooling. At a red heat it is volatilized, evolving vapors of mercury and of sulphur dioxide, and leaving no residue.

A solution of the salt in nitric or hydrochloric acid, diluted with water, gives with potassium iodide T.S. a red precipitate, and with barium chloride T.S. a white one.

The salt should be completely soluble in 10 parts of hydrochloric acid (absence of *mercurous salt* or of *lead*).

HYDRARGYRUM.

MERCURY.

Hg = 199.8.

[QUICKSILVER.]

Mercury should be kept in strong, well-stoppered bottles.

A shining, silver-white metal, without odor or taste.

It is liquid at the ordinary temperature, and easily divisible into spherical globules; but, when cooled to -39.38° C. (-38.88° F.), it forms a ductile, malleable mass.

Specific gravity: 13.5584 at 15° C. (59° F.).

Insoluble in the ordinary solvents, also in concentrated hydrochloric acid, and, at common temperatures, in sulphuric acid; but it dissolves in the latter, when boiled with it, and is readily and completely soluble in nitric acid.

At ordinary temperatures it volatilizes very slowly, more rapidly as the temperature increases, and at 357.25° C. (675.05° F.) it boils, and is completely volatilized, yielding a colorless and very poisonous vapor.

When globules of Mercury are dropped upon white paper, they should roll about freely, retaining their globular form, and leaving no streaks or traces.

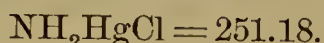
It should be perfectly dry and present a bright surface.

On boiling 5 Gm. of Mercury with 5 Cc. of water and 4.5 Gm. of sodium hyposulphite, in a test-tube, for about one minute, the Mercury should not lose its lustre, and should not acquire more than a slightly yellowish shade (absence of more than *slight traces of foreign metals*).

Preparations: Emplastrum Ammoniaci cum Hydrargyro. Emplastrum Hydrargyri. Hydrargyrum cum Creta. Massa Hydrargyri. Unguentum Hydrargyri.

HYDRARGYRUM AMMONIATUM.

AMMONIATED MERCURY.



[WHITE PRECIPITATE. MERCURIC AMMONIUM CHLORIDE.]

Corrosive Mercuric Chloride, in powder, *one hundred*

grammes..... 100 Gm.

Ammonia Water,

Distilled Water, each, *a sufficient quantity*.

Dissolve the Corrosive Mercuric Chloride in *two thousand* (2000) *cubic centimeters* of warm Distilled Water, filter the solution, and allow it to cool. Pour the filtered liquid gradually, and with constant stirring, into *one hundred and fifty* (150) *cubic centimeters* of Ammonia Water, taking care that the latter shall remain in slight excess. Collect the precipitate on a filter, and, when the liquid has drained from it as much as possible, wash it with a mixture of *four hundred* (400) *cubic centimeters* of Distilled Water and *twenty* (20) *cubic centimeters* of Ammonia Water. Finally, dry the precipitate between sheets of bibulous paper, in a dark place, at a temperature not exceeding 30° C. (86° F.).

Keep the product in well-stoppered bottles, protected from light.

White, pulverulent pieces, or a white, amorphous powder, without odor, and having an earthy, afterwards styptic and metallic taste. Permanent in the air.

Almost insoluble in water or in alcohol. By prolonged washing with water it is gradually decomposed, assuming a yellow color, and becoming converted into a basic salt. Readily soluble in warm hydrochloric, nitric, or acetic acid, and in a cold solution of ammonium carbonate. Also completely soluble in a cold solution of sodium hyposulphite, with the evolution of ammonia. When this solution is heated for a short time, red mercuric sulphide is separated, which, on protracted boiling, turns black.

At a temperature below a red heat the salt is decomposed without fusion, and at a red heat it is wholly volatilized.

When heated with potassium or sodium hydrate T.S., the salt turns yellow, and evolves vapor of ammonia.

The solution of the salt in diluted nitric acid gives with potassium iodide T.S. a red precipitate, and with silver nitrate T.S. a white one.

The salt should be soluble in hydrochloric acid without effervescence (absence of *carbonate*), and without leaving a residue (absence of *mercurous salt*).

Its solution in acetic acid should not be rendered turbid by diluted sulphuric acid (absence of *lead*).

Preparation: Unguentum Hydrargyri Ammoniaci.

HYDRARGYRUM CUM CRETA.

MERCURY WITH CHALK.

Mercury, <i>thirty-eight grammes</i>	38 Gm.
Clarified Honey, <i>ten grammes</i>	10 Gm.
Prepared Chalk, <i>fifty-seven grammes</i>	57 Gm.
Water, <i>a sufficient quantity</i> ,	
To make <i>one hundred grammes</i> . . .	100 Gm.

Weigh the Mercury and Clarified Honey successively into a strong bottle of the capacity of *one hundred* (100) *cubic centimeters*, and add *two* (2) *cubic centimeters* of Water. Cork the bottle, and shake it for about half an hour at a time, until the aggregate time of shaking reaches ten hours, or until the globules of Mercury are no longer visible under a lens magnifying *four* (4) *diameters*. The shaking may be more conveniently performed by mechanical means. Rub the Prepared Chalk with Water, in a mortar, to a thick, creamy paste, and, having added the contents of the bottle, washing the last portions in with a little Water, triturate the whole to a uniform mixture. Finally dry the mixture, first between ample layers of bibulous paper, and afterwards in a capsule, at the ordinary temperature, until it weighs *one hundred* (100) *grammes*. Then reduce it to a uniform powder, without trituration, and keep it in well-stoppered bottles, protected from light.

A light gray, rather damp powder, free from grittiness, without odor, and having a slightly sweetish taste.

If a portion of the powder be digested with warm acetic acid, the chalk is dissolved with effervescence, leaving a residue of finely divided mercury. The filtrate should not become more than slightly opalescent on the addition of a few drops of hydrochloric acid (limit of *mercurous oxide*).

If another portion of the powder be digested with warm, diluted hydrochloric acid, the filtrate should not be affected by hydrogen sulphide T.S., or by stannous chloride T.S. (absence of *mercuric oxide*).

HYDRASTININÆ HYDROCHLORAS.

HYDRASTININE HYDROCHLORATE.



The hydrochlorate of an artificial alkaloid derived from hydrastine, the latter being a colorless alkaloid obtained from Hydrastis.

Hydrastinine Hydrochlorate should be kept in well-stoppered vials.

Light yellow, amorphous granules, or a pale yellow, crystalline powder, odorless, and having a bitter, saline taste; deliquescent on exposure to damp air.

Soluble, at 15° C. (59° F.), in 0.3 part of water, and in 3 parts of alcohol; difficultly soluble in ether or chloroform.

When heated to 173° C. (343.4° F.), the salt undergoes partial fusion, but does not liquefy. Upon ignition, it is consumed, leaving no residue.

The salt has an acid reaction upon litmus paper.

A dilute aqueous solution of the salt (up to about 1 in 100,000) has a decided blue fluorescence.

The salt dissolves in sulphuric acid with effervescence, coloring the acid yellowish-red.

An aqueous solution of the salt is not precipitated by ammonia water.

An aqueous solution of the salt yields, with silver nitrate T.S., a white precipitate insoluble in nitric acid.

On adding to 2 Cc. of an aqueous solution of the salt (1 in 100) an excess of bromine water, a yellow precipitate is produced, which is dissolved by ammonia water to a nearly colorless liquid (difference from *hydrastine*, with which the ammonia produces a brick-red precipitate).

HYDRASTIS.

HYDRASTIS.

[GOLDEN SEAL.]

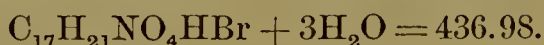
The rhizome and roots of *Hydrastis canadensis* Linné (nat. ord. *Ranunculaceæ*).

Rhizome about 4 Cm. long and 6 Mm. thick ; oblique, with short branches, somewhat annulate and longitudinally wrinkled ; externally brownish-gray ; fracture short, waxy, bright reddish-yellow, with a thickish bark, about ten narrow wood-wedges, broad medullary rays, and large pith. Roots thin, brittle, with a thick, yellow bark and subquadrangular, woody centre. Odor slight ; taste bitter.

Preparations : Extractum Hydrastis Fluidum. Glyceritum Hydrastis. Tinctura Hydrastis.

HYOSCINÆ HYDROBROMAS.

HYOSCINE HYDROBROMATE.



The hydrobromate of an alkaloid obtained from *Hyoscyamus*. It should be kept in small, well-stoppered vials.

Colorless, transparent, rhombic crystals, odorless, and having an acrid, slightly bitter taste ; permanent in the air.

Soluble, at 15° C. (59° F.), in 1.9 parts of water, and in 13 parts of alcohol ; very slightly soluble in ether or chloroform.

When heated to 100° C. (212° F.), the salt loses its water of crystallization, and fuses to a thick, syrupy mass, which becomes quite fluid at 160° C. (320° F.).

When ignited, it is consumed, leaving no residue.

The salt is neutral to litmus paper.

Addition of ammonia water to the aqueous solution of the salt (1 in 60) produces no change, but sodium or potassium hydrate T.S. causes a white turbidity.

Addition of silver nitrate T.S. to the aqueous solution produces a yellowish-white precipitate, which is insoluble in nitric acid ; but, when filtered off and washed, is soluble in ammonia water diluted with its own volume of water.

If 5 drops of fuming nitric acid be added to 0.01 Gm. of the salt, in a small porcelain capsule, and the mixture be evaporated to dryness on a water-bath, a scarcely tinted residue will be left, which, when treated, after cooling, with a few drops of an alcoholic solution of potassium hydrate, will assume a violet color.

HYOSCYAMINÆ HYDROBROMAS.**HYOSCYAMINE HYDROBROMATE.**

The hydrobromate of an alkaloid obtained from *Hyoscyamus*. It should be kept in small, well-stoppered vials.

A yellowish-white, amorphous, resin-like mass, or prismatic crystals, having, particularly when damp, a tobacco-like odor, and an acrid, nauseous, and bitter taste ; deliquescent on exposure to air.

Soluble, at 15° C. (59° F.), in about 0.3 part of water, 2 parts of alcohol, 3000 parts of ether, or 250 parts of chloroform.

At 78° C. (172.4° F.) the salt melts, forming a nearly colorless liquid. When ignited, it is consumed, leaving no residue.

The salt is neutral to litmus paper.

An aqueous solution of the salt is not precipitated by platinic chloride T.S. (difference from *most other alkaloids*).

With gold chloride T.S. it yields a precipitate which, when recrystallized from a small quantity of boiling water acidulated with hydrochloric acid, is deposited, on cooling, in minute, lustrous, golden-yellow scales (difference from *atropine*).

The aqueous solution of the salt yields, with silver nitrate T.S., a yellowish-white precipitate, which is insoluble in nitric acid ; but, when filtered off and washed, is soluble in ammonia water diluted with its own volume of water.

HYOSCYAMINÆ SULPHAS.**HYOSCYAMINE SULPHATE.**

The neutral sulphate of an alkaloid obtained from *Hyoscyamus*. It should be kept in small, well-stoppered vials.

White, indistinct crystals, or a white powder, without odor, and having a bitter, acrid taste ; deliquescent in damp air.

Soluble, at 15° C. (59° F.), in 0.5 part of water, and in 2.5 parts of alcohol ; very slightly soluble in ether or chloroform.

At 140° to 160° C. (284° to 320° F.) the salt melts, and, upon ignition, is consumed, leaving no residue.

The salt is neutral to litmus paper.

An aqueous solution of the salt is not precipitated by platinic chloride T.S. (difference from *most other alkaloids*).

With gold chloride T.S. it yields a precipitate which, when recrystallized from a small quantity of boiling water acidulated with hydrochloric acid, is deposited, on cooling, in minute, lustrous, golden-yellow scales (difference from *atropine*).

The aqueous solution of the salt yields, with barium chloride T.S., a white precipitate insoluble in hydrochloric acid.

HYOSCYAMUS.**HYOSCYAMUS.**

[HENBANE.]

The leaves and flowering tops of *Hyoscyamus niger* Linné (nat. ord. *Solanaceæ*), collected from plants of the second year's growth.

Leaves ovate, or ovate-oblong, up to 25 Cm. long and 10 Cm. broad ; sinuate-toothed, the teeth large, oblong or triangular ; grayish-green, and, particularly on the lower surface, glandular-hairy ; midrib prominent ; flowers nearly sessile, with an urn-shaped, five-toothed calyx, and a light yellow, purple-veined corolla ; odor heavy, narcotic ; taste bitter and somewhat acrid.

Preparations : Extractum Hyoscyami. Extractum Hyoscyami Fluidum. Tinctura Hyoscyami.

ICHTHYOCOLLA.

ISINGLASS.

The swimming-bladder of *Acipenser Huso* Linné, and of other species of *Acipenser* (class *Pisces* ; order *Sturiones*).

In separate sheets, sometimes rolled, of a horny or pearly appearance ; whitish or yellowish, semi-transparent, iridescent, inodorous, insipid ; almost entirely soluble in boiling water and in boiling diluted alcohol.

A solution of Isinglass in 24 parts of boiling water forms, on cooling, a transparent jelly.

Preparation : Emplastrum Ichthyocollæ.

ILLICIUM.

ILLICIUM.

[STAR-ANISE.]

The fruit of *Illicium verum* Hooker filius (nat. ord. *Magnoliaceæ*).

The fruit is pedunculate and consists of eight stellately arranged carpels, which are boat-shaped, about 10 Mm. long, rather woody, wrinkled, straight-beaked, brown, deliscent on the upper suture, internally reddish-brown, glossy, and containing a single, flattish, oval, glossy, brownish-yellow seed ; odor anise-like ; taste of the carpels sweet and aromatic, and of the seeds oily.

Star-anise should not be confounded with the very similar but poisonous fruit of *Illicium anisatum* Linné (*Illicium religiosum* Siebold), the carpels of which are more woody, shrivelled, and have a thin, mostly curved beak, a faint, clove-like odor, and an unpleasant taste.

INFUSA.

INFUSIONS.

An ordinary Infusion, the strength of which is not directed by the physician, nor specified by the Pharmacopœia, shall be prepared by the following formula :

Take of

The Substance, coarsely comminuted, <i>fifty grammes</i> . . .	50 Gm.
Boiling Water, <i>one thousand cubic centimeters</i>	1000 Cc.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

Put the substance into a suitable vessel provided with a cover, pour upon it the Boiling Water, cover the vessel tightly, and let it stand for half an hour. Then strain, and pass enough Water through the strainer to make the Infusion measure *one thousand* (1000) *cubic centimeters*.

CAUTION.—The strength of Infusions of energetic or powerful substances should be specially prescribed by the physician.

INFUSUM CINCHONÆ.

INFUSION OF CINCHONA.

Cinchona, in No. 40 powder, <i>sixty grammes</i>	60 Gm.
Aromatic Sulphuric Acid, <i>ten cubic centimeters</i>	10 Cc.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix the Acid with *five hundred* (500) *cubic centimeters* of Water, and moisten the powder with *thirty* (30) *cubic centimeters* of the mixture; pack it firmly in a conical glass percolator, and gradually pour upon it, first, the remainder of the mixture, and afterwards Water, until the Infusion measures *one thousand* (1000) *cubic centimeters*.

INFUSUM DIGITALIS.

INFUSION OF DIGITALIS.

Digitalis, bruised, <i>fifteen grammes</i>	15 Gm.
Alcohol, <i>one hundred cubic centimeters</i>	100 Cc.
Cinnamon Water, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
Boiling Water, <i>five hundred cubic centimeters</i>	500 Cc.
Cold Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Upon the Digitalis, contained in a suitable vessel, pour the Boiling Water, and allow it to macerate until the mixture is cold. Then strain, add the Alcohol and Cinnamon Water to the strained liquid, and pass enough Cold Water through the residue on the strainer to make the product measure *one thousand* (1000) *cubic centimeters*.

INFUSUM PRUNI VIRGINIANÆ.

INFUSION OF WILD CHERRY.

Wild Cherry, in No. 20 powder, <i>forty grammes</i>	40 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *sixty* (60) *cubic centimeters* of Water, and macerate for one hour; then pack it firmly in a conical glass percolator, and gradually pour Water upon it until the Infusion measures *one thousand* (1000) *cubic centimeters*.

INFUSUM SENNÆ COMPOSITUM.

COMPOUND INFUSION OF SENNA.

[BLACK DRAUGHT.]

Senna, <i>sixty grammes</i>	60 Gm.
Manna, <i>one hundred and twenty grammes</i>	120 Gm.
• Magnesium Sulphate, <i>one hundred and twenty grammes</i> ..	120 Gm.
Fennel, bruised, <i>twenty grammes</i>	20 Gm.
Boiling Water, <i>eight hundred cubic centimeters</i>	800 Cc.
Cold Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Upon the Senna and Fennel, contained in a suitable vessel, pour the Boiling Water, and macerate until the mixture is cold. Then strain with expression, dissolve in the infusion the Magnesium Sulphate and Manna, and again strain. Lastly, add enough Cold Water through the strainer containing the Senna and Fennel to make the Infusion measure *one thousand* (1000) *cubic centimeters*.

INULA.

INULA.

[ELECAMPANE.]

The root of *Inula Helenium* Linné (nat. ord. *Compositæ*).

In transverse, concave slices or longitudinal sections, with overlapping bark, externally wrinkled and brown; flexible in damp weather; when dry, breaking with a short fracture; internally grayish, fleshy, slightly radiate, and dotted with numerous shining, yellowish-brown resin-cells; free from starch; odor peculiar, aromatic; taste bitter and pungent.

IODIFORMUM.

IODIFORM.

$\text{CHI}_3 = 392.56.$

Iodoform should be kept in well-stoppered bottles, in a cool and dark place.

Small, lemon-yellow, lustrous crystals of the hexagonal system, having a peculiar, very penetrating and persistent odor somewhat resembling that of saffron and iodine, and an unpleasant, slightly sweetish, and iodine-like taste. Specific gravity: 2.000 at 15° C. (59° F.).

Very slightly soluble in water, to which it, however, imparts its odor and taste. Soluble in about 52 parts of alcohol at 15° C. (59° F.), in about 12 parts of boiling alcohol, and in 5.2 parts of ether. Very soluble in chloroform, benzin, and fixed and volatile oils.

Iodoform is slightly volatile even at ordinary temperatures, and in boiling water distils slowly over with its vapor. At about 115° C. (239° F.) it melts to a brown liquid, and at a higher temperature emits vapors of iodine, leaving behind a carbonaceous mass which, upon full combustion, should be completely dissipated (absence of *fixed impurities*).

On digesting about 0.1 Gm. of Iodoform with 5 Cc. of a 5-per-cent. solution of potassium hydrate in alcohol, and then slightly supersaturating with diluted nitric acid, the liquid will be rendered blue by starch T.S.

The solutions in neutral solvents are neutral to litmus paper.

If 2 Gm. of Iodoform be thoroughly shaken with 10 Cc. of water, the filtrate should be colorless and free from bitter taste (absence of *soluble yellow coloring matters, picric acid*, etc.), should not affect the color of litmus paper (absence of *free acids*), and should remain unaffected by silver nitrate T.S. (absence of *soluble iodides*).

Preparation: Unguentum Iodoformi.

IODUM.

IODINE.

I = 126.53.

Iodine should be kept in glass-stoppered bottles, in a cool place.

Heavy, bluish-black, dry and friable, rhombic plates, having a metallic lustre, a distinctive odor, and a sharp and acrid taste.

Specific gravity : 4.948 at 17° C. (62.6° F.).

Iodine imparts a deep brown, slowly evanescent stain to the skin, and slowly destroys vegetable colors.

Soluble in about 5000 parts of water, and in 10 parts of alcohol at 15° C. (59° F.) with a brown color; also freely soluble in ether, and in a solution of potassium iodide with a brown color; and in chloroform or carbon disulphide with a violet color.

It volatilizes slowly at ordinary temperatures. When heated to 114° C. (237.2° F.), it melts, and is gradually dissipated in form of a purple vapor, leaving no residue.

With starch T.S. it produces a dark blue color.

A solution of Iodine in chloroform should be perfectly clear and limpid (absence of *moisture*).

To determine the presence of *cyanogen, chlorine, or bromine*, proceed as follows :

Triturate 0.5 Gm. of finely-powdered Iodine with 20 Cc. of water, and filter off the solution. To one-half of this solution, in a test-tube, carefully add decinormal sodium hyposulphite V.S., until the solution is just decolorized. Then add a few drops of ferrous sulphate T.S., and subsequently a little sodium hydrate T.S., and heat the mixture gently. On now adding a slight excess of hydrochloric acid, the liquid should not assume a blue color (absence of *iodine cyanide*).

To the other half of the aqueous filtrate, in a test-tube, add a slight excess of silver nitrate T.S., shake actively, allow the precipitate to subside, and, having poured off the clear, supernatant liquid completely, shake the precipitate with a mixture of 1 Cc. of ammonia water and 9 Cc. of water, and filter. Upon the addition of a slight excess of nitric acid to the filtrate, not more than a slight opalescence should make its appearance (limit of *chlorine or bromine*).

If 0.32 Gm. of Iodine, together with 1 Gm. of potassium iodide, be dissolved in 20 Cc. of water, and the solution mixed with a few drops of starch T.S., it should require not less than 25 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (corresponding to at least 98.85 per cent. of pure Iodine).

Preparations : Liquor Iodi Compositus. Tinctura Iodi. Unguentum Iodi.

IPECACUANHA.

IPECAC.

The root of *Cephaëlis Ipecacuanha* (Brotero) A. Richard (nat. ord. *Rubiaceæ*).

About 10 Cm. long, and 4 or 5 Mm. thick ; mostly simple, contorted, dull grayish-brown or blackish, finely wrinkled ; closely and irregularly annulated, and often transversely fissured ; bark thick, brittle, brownish, easily separated from the thin, whitish, tough, ligneous portion ; odor slight, peculiar, nauseous ; taste bitterish, acrid, nauseating.

When Ipecac is sound and free from mouldiness, its quality is proportionate to the thickness of the bark, and the thinness of the ligneous portion.

Preparations : Extractum Ipecacuanhæ Fluidum. Pulvis Ipecacuanhæ et Opii. Trochisci Ipecacuanhæ. Trochisci Morphinae et Ipecacuanhæ.

IRIS.

IRIS.

[BLUE FLAG.]

The rhizome and roots of *Iris versicolor* Linné (nat. ord. *Iridææ*).

Rhizome of horizontal growth, consisting of joints, 5 to 10 Cm. long, cylindrical in the lower half, flattish near the upper extremity, and terminated by a circular scar, annulated from the leaf-sheaths, grayish-brown ; roots long, simple, crowded near the broad end ; odor slight ; taste acrid and nauseous.

Preparations : Extractum Iridis. Extractum Iridis Fluidum.

JALAPA.

JALAP.

The tuberous root of *Ipomœa Jalapa* Nuttall (nat. ord. *Convolvulacææ*).

Napiform, pyriform or oblong, varying in size, the large roots incised, more or less wrinkled, dark brown, with lighter-colored spots, and short, transverse ridges ; hard, compact, internally pale grayish-brown, with numerous concentric circles composed of small resin-cells ; fracture resinous, not fibrous ; odor slight, but peculiar, smoky and sweetish ; taste sweetish and acrid.

On exhausting 100 parts of Jalap with alcohol, concentrating the tincture to 40 parts, and pouring it into water, a precipitate of resin should be obtained, which, when washed with water, and dried, should weigh not less than 12 parts, and of which not over 10 per cent. should be soluble in ether.

Preparations : Extractum Jalapæ. Pulvis Jalapæ Compositus. Resina Jalapæ.

JUGLANS.**JUGLANS.**

[BUTTERNUT.]

The bark of the root of *Juglans cinerea* Linné (nat. ord. *Juglandaceæ*), collected in autumn.

In flat or curved pieces, about 5 Mm. thick; the outer surface dark gray and nearly smooth, or deprived of the soft cork and deep brown; the inner surface smooth and striate; transverse fracture short, delicately checkered, whitish and brown; odor feeble; taste bitter and somewhat acrid.

Preparation: Extractum Juglandis.

KAMALA.**KAMALA.**

[ROTTLERA, PHARM. 1870.]

The glands and hairs from the capsules of *Mallotus philippinensis* (Lamarck) Mueller Arg. (nat. ord. *Euphorbiaceæ*).

A granular, mobile, brick-red or brownish-red powder, inodorous and nearly tasteless, imparting a deep red color to alkaline liquids, alcohol, ether, or chloroform, and a pale yellow tinge to boiling water. Under the microscope it is seen to consist of stellately arranged, colorless hairs, mixed with depressed-globular glands, containing numerous red, club-shaped vesicles.

Upon ignition it should leave not more than 8 per cent. of ash.

KINO.**KINO.**

The inspissated juice of *Pterocarpus Marsupium* Roxburgh (nat. ord. *Leguminosæ*).

Small, angular, dark brownish-red, shining pieces, brittle, in thin layers ruby-red and transparent, inodorous, very astringent and sweetish, tingeing the saliva deep red.

Soluble in alcohol, nearly insoluble in ether, and only slightly soluble in cold water.

Preparation: Tinctura Kino.

KRAMERIA.**KRAMERIA.**

[RHATANY.]

The root of *Krameria triandra* Ruiz et Pavon, and of *Krameria Ixina* Linné (nat. ord. *Polygalææ*).

From 1 to 3 Cm. thick, knotty and several-headed above, branched below, the branches long; bark smooth or, in the thinner pieces, scaly, deep rust-

brown, 1 to 2 Mm. thick, very astringent, inodorous; wood pale brownish-red, tough, with fine medullary rays, nearly tasteless.

The root of *Krameria Ixina* (Savanilla Rhatany) is less knotty and more slender, and has a dark purplish-brown bark, about 3 Mm. thick.

Preparations: Extractum Krameriae. Extractum Krameriae Fluidum. Tinctura Krameriae.

LACTUCARIUM.

LACTUCARIUM.

The concrete milk-juice of *Lactuca virosa* Linné (nat. ord. *Compositæ*).

In sections of plano-convex, circular cakes, or in irregular, angular pieces, externally grayish-brown or dull reddish-brown, internally whitish or yellowish, of a waxy lustre; odor heavy, somewhat narcotic; taste bitter.

It is partly soluble in alcohol and in ether. When triturated with water, it yields a turbid mixture, and, when boiled with water, it softens and yields a brownish-colored liquid which, after cooling, is not colored blue by iodine T.S.

Preparation: Tinctura Lactucarii.

LAPPA.

LAPPA.

[BURDOCK.]

The root of *Arctium Lappa* Linné, and of some other species of *Arctium* (nat. ord. *Compositæ*).

About 30 Cm. or more long, and, in its thickest portion, from 1 to 2 Cm. thick; nearly simple, fusiform, fleshy, longitudinally wrinkled, crowned with a tuft of whitish, soft, hairy leaf-stalks; grayish-brown, internally paler; fracture somewhat horny; bark rather thick, the inner part and the wood radially striate, the parenchyma free from starch,—often with cavities lined with white remains of tissue; odor feeble and unpleasant; taste mucilaginous, sweetish and somewhat bitter.

Preparation: Extractum Lappæ Fluidum.

LEPTANDRA.

LEPTANDRA.

[CULVER'S ROOT.]

The rhizome and roots of *Veronica virginica* Linné (nat. ord. *Scrophularinæ*).

Of horizontal growth, from 10 to 15 Cm. long, and about 5 Mm. thick, somewhat flattened, bent and branched, deep blackish-brown, with cup-shaped scars on the upper side, hard, of a woody fracture, with a thin, blackish bark, a hard, yellowish wood, and a large, purplish-brown, about six-rayed pith; roots thin, wrinkled, very fragile; inodorous; taste bitter and feebly acrid.

Preparations: Extractum Leptandræ. Extractum Leptandræ Fluidum.

LIMONIS CORTEX.

LEMON PEEL.

The rind of the recent fruit of *Citrus Limonum* Risso (nat. ord. *Rutaceæ*).

In narrow, thin bands or in elliptical segments, with very little of a spongy, white, inner layer adhering to them; outer surface deep lemon-yellow, and ruggedly glandular; odor fragrant; taste aromatic and bitterish.
The spongy, inner layer usually present in the segments should be removed before the Lemon Peel is used.

Preparation: Spiritus Limonis.

LIMONIS SUCCUS.

LEMON JUICE.

The freshly expressed juice of the ripe fruit of *Citrus Limonum* Risso (nat. ord. *Rutaceæ*).

A slightly turbid, yellowish liquid, usually having an odor of lemon due to the accidental presence of some of the volatile oil of the rind. Taste acid, and often slightly bitter.
Specific gravity: not less than 1.030 at 15° C. (59° F.).
It has an acid reaction upon litmus paper, due to the presence of about 7 per cent. of citric acid.
On evaporating 100 Gm. of the juice to dryness, and igniting the residue, not more than 0.5 Gm. of ash should remain.

LINIMENTUM AMMONIÆ.

AMMONIA LINIMENT.

[VOLATILE LINIMENT.]

Ammonia Water, <i>three hundred and fifty cubic centimeters</i>	350 Cc.
Alcohol, <i>fifty cubic centimeters</i>	50 Cc.
Cotton Seed Oil, <i>six hundred cubic centimeters</i>	600 Cc.
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To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix them by agitation in a bottle, which should be well stoppered. This Liniment should be freshly prepared, when wanted.

LINIMENTUM BELLADONNÆ.

BELLADONNA LINIMENT.

Camphor, <i>fifty grammes</i>	50 Gm.
Fluid Extract of Belladonna Root, <i>a sufficient quantity</i> ,	
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To make <i>one thousand cubic centimeters</i>	1000 Cc.

Dissolve the Camphor in about *two hundred* (200) *cubic centimeters* of the Fluid Extract, and then add enough of the latter to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

LINIMENTUM CALCIS.

LIME LINIMENT.

[CARRON OIL.]

Solution of Lime,
Linseed Oil, of each, *one volume*.

Mix them by agitation.

LINIMENTUM CAMPHORÆ.

CAMPBOR LINIMENT.

Camphor, in coarse powder, <i>two hundred grammes</i>	200 Gm.
Cotton Seed Oil, <i>eight hundred grammes</i>	800 Gm.

To make *one thousand grammes* 1000 Gm.

Introduce the Camphor and the Cotton Seed Oil into a suitable flask, and apply a gentle heat, by means of a water-bath, loosely stoppering the flask during the operation. Agitate from time to time, until the Camphor is dissolved.

LINIMENTUM CHLOROFORMI.

CHLOROFORM LINIMENT.

Chloroform, <i>three hundred cubic centimeters</i>	300 Cc.
Soap Liniment, <i>seven hundred cubic centimeters</i>	700 Cc.

To make *one thousand cubic centimeters* 1000 Cc.

Mix them by agitation.

LINIMENTUM SAPONIS.

SOAP LINIMENT.

Soap, in fine powder, <i>seventy grammes</i>	70 Gm.
Camphor, in small pieces, <i>forty-five grammes</i>	45 Gm.
Oil of Rosemary, <i>ten cubic centimeters</i>	10 Cc.
Alcohol, <i>seven hundred and fifty cubic centimeters</i>	750 Cc.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* 1000 Cc.

Introduce the Camphor and the Alcohol into a suitable bottle, and shake until the Camphor is dissolved. Then add the Soap and Oil of Rosemary, and shake the bottle well for a few minutes. Lastly, add enough Water to make *one thousand (1000) cubic centimeters*, and again shake until the liquid becomes clear. Set it aside, in a cool place, for twenty-four hours, then filter.

Preparation: Linimentum Chloroformi.

LINIMENTUM SAPONIS MOLLIS.**LINIMENT OF SOFT SOAP.**

[TINCTURA SAPONIS VIRIDIS, PHARM. 1880.]

Soft Soap, <i>six hundred and fifty grammes</i>	650 Gm.
Oil of Lavender Flowers, <i>twenty cubic centimeters</i>	20 Cc.
Alcohol, <i>three hundred cubic centimeters</i>	300 Cc.
Water, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix the Oil of Lavender Flowers with the Alcohol, dissolve in this the Soft Soap by stirring or agitation, and set the solution aside for twenty-four hours. Then filter it through paper, and pass enough Water through the filter to make the product measure *one thousand (1000) cubic centimeters*. Mix thoroughly.

LINIMENTUM SINAPIS COMPOSITUM.**COMPOUND LINIMENT OF MUSTARD.**

Volatile Oil of Mustard, <i>thirty cubic centimeters</i>	30 Cc.
Fluid Extract of Mezereum, <i>two hundred cubic centimeters</i>	200 Cc.
Camphor, <i>sixty grammes</i>	60 Gm.
Castor Oil, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
Alcohol, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Dissolve the Camphor in *five hundred (500) cubic centimeters* of Alcohol, and add the Fluid Extract of Mezereum; then add the Oil of Mustard and the Castor Oil and, finally, enough Alcohol to make the product measure *one thousand (1000) cubic centimeters*. Mix thoroughly.

LINIMENTUM TEREBINTHINÆ.**TURPENTINE LINIMENT.**

Resin Cerate, <i>six hundred and fifty grammes</i>	650 Gm.
Oil of Turpentine, <i>three hundred and fifty grammes</i>	350 Gm.
To make <i>one thousand grammes</i>	1000 Gm.

Melt the Resin Cerate in a capsule, on a water-bath, then add the Oil of Turpentine, and mix them thoroughly.

LINUM.

LINSEED.

[FLAXSEED.]

The seed of *Linum usitatissimum* Linné (nat. ord. *Linææ*).

About 4 or 5 Mm. long, oblong-ovate, flattened, obliquely pointed at one end, brown, glossy, covered with a transparent, mucilaginous epithelium, which swells considerably in water; the embryo whitish or pale greenish, with two large, oily, plano-convex cotyledons, and a thin perisperm; inodorous; taste mucilaginous, oily and bitter.

Ground Linseed (Linseed Meal, or Flaxseed Meal), for medicinal purposes, should be recently prepared, free from unpleasant or rancid odor. When extracted with carbon disulphide, it should yield not less than 25 per cent. of fixed oil.

The filtered infusion of Ground Linseed, prepared with boiling water and allowed to cool, has an insipid, mucilaginous taste, and should not be colored blue by iodine T.S. (absence of *starch*).

LIQUOR ACIDI ARSENOSI.

SOLUTION OF ARSENOUS ACID.

Arsenous Acid, *ten grammes* 10 Gm.

Diluted Hydrochloric Acid, *fifty cubic centimeters* 50 Cc.

Distilled Water, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix the Diluted Hydrochloric Acid with *two hundred and fifty* (250) *cubic centimeters* of Distilled Water, add the Arsenous Acid, and boil the mixture until all the Arsenous Acid is dissolved. Filter the solution, and pass enough Distilled Water through the filter to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

A clear, colorless liquid, odorless, having an acidulous taste and an acid reaction.

If 24.7 Cc. of Solution of Arsenous Acid be boiled for a few minutes with 2 Gm. of sodium bicarbonate, the liquid cooled, diluted with water to 100 Cc., and mixed with a little starch T.S., it should require from 49.4 to 50 Cc. of decinormal iodine V.S. to produce the blue tint of iodide of starch (corresponding to 1 Gm. of arsenous acid in 100 Cc. of the Solution).

LIQUOR AMMONII ACETATIS.

SOLUTION OF AMMONIUM ACETATE.

[SPIRIT OF MINDERERUS.]

An aqueous solution of Ammonium Acetate [$\text{NH}_4\text{C}_2\text{H}_3\text{O}_2 = 76.87$], containing about 7 per cent. of the salt, together with small amounts of acetic and carbonic acids.

Ammonium Carbonate, *five grammes* 5 Gm.

Diluted Acetic Acid, *one hundred cubic centimeters* 100 Cc.

Add the Ammonium Carbonate (which should be in translucent pieces, free from white, pulverulent bicarbonate) gradually to the cold Diluted Acetic Acid, and stir until it is dissolved.

This preparation should be freshly made when wanted.

A clear, colorless liquid, free from empyreuma, of a mildly saline, acidulous taste, and an acid reaction.

It is wholly volatilized by heat.

When Solution of Acetate of Ammonium is heated with potassium or sodium hydrate, vapor of ammonia is evolved.

When heated with sulphuric acid, the Solution gives off vapor of acetic acid.

Preparation: *Liquor Ferri et Ammonii Acetatis*.

LIQUOR ARSENI ET HYDRARGYRI IODIDI.

SOLUTION OF ARSENIC AND MERCURIC IODIDE.

[DONOVAN'S SOLUTION.]

Arsenic Iodide, *ten grammes* 10 Gm.

Red Mercuric Iodide, *ten grammes*. 10 Gm.

Distilled Water, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . 1000 Cc.

Powder the Arsenic Iodide, and mix it with the Red Mercuric Iodide by trituration. Add *one hundred and fifty* (150) *cubic centimeters* of Distilled Water, and continue the trituration until solution is effected. Filter the solution, and pass enough Distilled Water through the filter to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

A clear, pale yellowish liquid, without odor, but having a disagreeable, metallic taste.

LIQUOR CALCIS.

SOLUTION OF LIME.

[SOLUTION OF CALCIUM HYDRATE. LIME WATER.]

A saturated, aqueous solution of Calcium Hydrate [$\text{Ca}(\text{OH})_2 = 73.83$].

The percentage of Calcium Hydrate varies with the temperature, being somewhat over 0.17 per cent. at 15° C. (59° F.), and diminishing as the temperature rises.

Lime, *twelve grammes* 12 Gm.

Distilled Water, *a sufficient quantity*.

Slake the Lime by the gradual addition of *seventy* (70) *cubic centimeters* of Distilled Water, then add *three hundred and sixty* (360) *cubic*

centimeters more of Distilled Water, and agitate occasionally during half an hour. Allow the mixture to settle, decant the liquid and throw it away. Then add to the residue *thirty-six hundred (3600) cubic centimeters* of Distilled Water, agitate thoroughly, wait a short time for the coarser particles to subside, and pour the liquid, holding the undissolved Lime in suspension, into a glass-stoppered bottle. From time to time shake the bottle, so as to keep the solution saturated.

Pour off the clear liquid when it is wanted for use.

A clear, colorless liquid, without odor, and having a saline and feebly caustic taste.

It absorbs carbon dioxide from the air, so that a pellicle of calcium carbonate forms on the surface of the liquid.

On being heated, it becomes turbid from separation of calcium hydrate, which redissolves again when the liquid is cooled.

It gives a strongly alkaline reaction with litmus paper.

The alkaline reaction of the Solution should entirely disappear, after it has been saturated with carbon dioxide, and subsequently boiled (absence of *alkalies* and *their carbonates*).

In other respects it should conform to the reactions and tests given under Lime (see *Calc.*).

50 Cc. of Solution of Lime should require, for complete neutralization, about 20 Cc. of decinormal oxalic acid V.S. (corresponding to about 0.14 (0.148) per cent. of Calcium Hydrate), phenolphthalein being used as indicator.

Preparation: Linimentum Calcis.

LIQUOR FERRI ACETATIS.

SOLUTION OF FERRIC ACETATE.

An aqueous solution of Ferric Acetate [$\text{Fe}_2(\text{C}_2\text{H}_3\text{O}_2)_6 = 464.92$], containing about 31 per cent. of the anhydrous salt, and corresponding to about 7.5 per cent. of metallic iron.

Solution of Ferric Sulphate, *one thousand grammes* . . . 1000 Gm.

Glacial Acetic Acid, *two hundred and sixty grammes* . . . 260 Gm.

Ammonia Water, *eight hundred and fifty cubic centimeters* 850 Cc.

Water,

Distilled Water, each, *a sufficient quantity*,

To make *one thousand grammes* . . . 1000 Gm.

Mix the Ammonia Water with *three thousand (3000) cubic centimeters* of cold Water, and the solution of Ferric Sulphate with *ten thousand (10000) cubic centimeters* of cold Water. Add the latter solution slowly to the diluted Ammonia Water, stirring constantly. Let the mixture stand until the precipitate has subsided as far as practicable, and then decant the supernatant liquid. Add to the precipitate *six thousand (6000) cubic centimeters* of boiling Water, mix well, and again

set the mixture aside, as before. Repeat the washing with successive portions of boiling Water, in the same manner, until the washings are no longer affected by sodium cobaltic nitrite test-solution (showing the removal of ammonia and its salts). Transfer the mixture to a wet muslin strainer, allow the precipitate to drain completely, and press it, folded in the strainer, until its weight is reduced to *seven hundred* (700) *grammes* or less. Now add the precipitate gradually to the Glacial Acetic Acid contained in a tared jar provided with a glass stopper, stirring the mixture after each addition until each portion added is nearly dissolved before adding another portion. Finally, add enough Distilled Water to make the product weigh *one thousand* (1000) *grammes*, mix thoroughly, allow it to become clear by subsidence, and decant the clear solution.

Keep the product in well-stoppered bottles, in a cool place, protected from light.

A dark reddish-brown, clear liquid, of an acetous odor, a sweetish, acidulous, somewhat styptic taste, and a slightly acid reaction.

Specific gravity : about 1.160 at 15° C. (59° F.).

The diluted Solution yields a brownish-red precipitate with ammonia water, and a blue one with potassium ferrocyanide T.S.

When heated to boiling, the Solution yields a brownish-red precipitate, and when heated with sulphuric acid, it emits acetous vapors.

If the iron be completely precipitated from a portion of the Solution by an excess of ammonia water, the filtrate should be colorless, and should not yield a white or dark-colored precipitate with hydrogen sulphide T.S. (absence of *zinc* or *copper*), nor should it leave a residue on evaporation and gentle ignition (absence of *salts of the fixed alkalies*).

If to a small portion of the Solution, diluted with about 10 volumes of water, a few drops of freshly prepared potassium ferricyanide T.S. be added, a pure brown color should be produced, without a tinge of green or greenish-blue (absence of *ferrous salt*).

If 1.12 (1.1176) Gm. of the Solution be introduced into a glass-stoppered bottle (having a capacity of about 100 Cc.), together with 15 Cc. of water and 2 Cc. of hydrochloric acid, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require about 15 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 0.5 per cent. of metallic iron).

LIQUOR FERRI CHLORIDI.

SOLUTION OF FERRIC CHLORIDE.

An aqueous solution of Ferric Chloride [$\text{Fe}_2\text{Cl}_6 = 323.98$], containing about 37.8 per cent. of the anhydrous salt, corresponding to 62.9 per cent. of the crystallized salt [$\text{Fe}_2\text{Cl}_6 + 12\text{H}_2\text{O} = 539.5$], or to about 13 per cent. of metallic iron.

Iron, in the form of fine, bright wire, and cut into small pieces, <i>one hundred and fifty grammes</i>	150 Gm.
Hydrochloric Acid, <i>eight hundred and seventy grammes</i> . .	870 Gm.
Nitric Acid,	
Distilled Water, each, <i>a sufficient quantity</i> ,	
To make <i>one thousand grammes</i>	1000 Gm.

Introduce the Iron Wire into a flask having a capacity of about *two thousand* (2000) *cubic centimeters*, pour upon it a mixture of *five hundred and forty* (540) *grammes* of Hydrochloric Acid and *two hundred and fifty* (250) *cubic centimeters* of Distilled Water, and let the mixture stand in a moderately warm place until effervescence ceases; then heat it to the boiling point, filter it through paper, and, having rinsed the flask and Iron Wire with a little hot Distilled Water, pass the rinsings through the filter. To the filtered liquid add *two hundred and eighty* (280) *grammes* of Hydrochloric Acid, add the mixture slowly and gradually, in a stream, to *eighty* (80) *grammes* of Nitric Acid contained in a capacious porcelain vessel, and warm gently. After effervescence ceases, apply heat, by means of a sand-bath, until the liquid is free from nitrous odor. Then test a few drops of the liquid, diluted with water, with freshly prepared potassium ferricyanide test-solution. Should this reagent produce a blue color, add a little more Nitric Acid, drop by drop, as long as effervescence is observed, and evaporate off the excess. Finally, add the remaining *fifty* (50) *grammes* of Hydrochloric Acid and enough Distilled Water to make the solution weigh *one thousand* (1000) *grammes*.

A reddish-brown liquid, having a faint odor of hydrochloric acid, an acid, strongly styptic taste, and an acid reaction.

Specific gravity: about 1.387 at 15° C. (59° F.).

The diluted Solution yields a brownish-red precipitate with ammonia water, a blue one with potassium ferrocyanide T.S., and a white one, insoluble in nitric acid, with silver nitrate T.S.

If the iron be completely precipitated from a portion of the Solution by an excess of ammonia water, the filtrate should be colorless, and should not yield a white or a dark-colored precipitate with hydrogen sulphide T.S. (absence of *zinc* or *copper*); nor should it leave a fixed residue on evaporation and gentle ignition (absence of *salts of the fixed alkalies*).

On adding a clear crystal of ferrous sulphate to a cooled mixture of equal volumes of concentrated sulphuric acid and a moderately dilute portion of the Solution, the crystal should not become colored brown, nor should there be a brownish-black color developed around it (absence of *nitric acid*).

If to a diluted portion of the Solution a few drops of freshly prepared potassium ferricyanide T.S. be added, a pure brown color should be produced, without a tinge of green or greenish-blue (absence of *ferrous salt*).

On diluting 1 Cc. of the Solution, with water, to 40 Cc., and boiling, the liquid should remain clear (absence of *oxychloride*).

If 1.12 (1.1176) Gm. of the Solution be introduced into a glass-stoppered bottle (having a capacity of about 100 Cc.), together with 15 Cc. of water and

2 Cc. of hydrochloric acid, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require about 26 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 0.5 per cent. of metallic iron).

Preparation: Tinctura Ferri Chloridi.

LIQUOR FERRI CITRATIS.

SOLUTION OF FERRIC CITRATE.

An aqueous solution of Ferric Citrate, corresponding to about 7.5 per cent. of metallic iron.

Solution of Ferric Sulphate, <i>one thousand and fifty grammes</i>	1050 Gm.
Citric Acid, <i>three hundred grammes</i>	300 Gm.
Ammonia Water, <i>eight hundred and eighty cubic centimeters</i>	880 Cc.
Water, <i>a sufficient quantity</i> ,	
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To make <i>one thousand grammes</i>	1000 Gm.

Mix the Ammonia Water with *three thousand* (3000) *cubic centimeters* of cold Water, and the Solution of Ferric Sulphate with *ten thousand* (10000) *cubic centimeters* of cold Water. Add the latter solution slowly to the diluted Ammonia Water, with constant stirring. Pour the mixture on a wet muslin strainer, and allow the liquid to run off and the precipitate to drain. Then remove the moist mass from the strainer, mix it well with *six thousand* (6000) *cubic centimeters* of cold Water, again pour it on the strainer, and let it drain. Repeat this washing with several successive portions of cold Water in the same manner, until the washings cease to produce more than a slight cloudiness with barium chloride test-solution. Then allow the precipitate to drain completely, transfer it to a porcelain capsule, add the Citric Acid, and heat the mixture, on a water-bath, to 60° C. (140° F.), stirring constantly, until the precipitate is dissolved. Lastly, filter the liquid, and evaporate it, at the above-mentioned temperature, until it weighs *one thousand* (1000) *grammes*.

A dark brown liquid, odorless, and possessing a slightly ferruginous taste.

Specific gravity: about 1.250 at 15° C. (59° F.).

Upon evaporating 100 Gm. of the Solution, in a thin layer, on plates of glass, about 42.5 to 43 Gm. of garnet-red scales will be obtained.

The Solution has an acid reaction upon litmus paper, and is not precipitated, but rendered darker in color, by ammonia water.

With potassium ferrocyanide T.S., it affords a bluish-green color or precipitate, which is increased and rendered dark blue by the subsequent addition of hydrochloric acid.

On heating the Solution with potassium or sodium hydrate T.S., it will yield a brown precipitate, without evolving vapor of *ammonia*.

If a portion of the Solution, diluted with 4 volumes of water, be deprived of its iron by boiling it with an excess of potassium or sodium hydrate T.S., and the filtrate slightly acidulated with acetic acid, a portion of this liquid, when allowed to stand for some time, should not give a white, crystalline precipitate (absence of *tartrate*).

If to another portion of the acidulated and cooled filtrate a little calcium chloride T.S. be added, and the liquid heated to boiling, it should gradually deposit a white, crystalline precipitate.

If 1.12 (1.1176) Gm. of the Solution be introduced into a glass-stoppered bottle (having a capacity of about 100 Cc.), together with 15 Cc. of water and 2 Cc. of hydrochloric acid, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require about 15 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 0.5 per cent. of metallic iron).

Preparations: Ferri Citras. Ferri et Ammonii Citras.

LIQUOR FERRI ET AMMONII ACETATIS.

SOLUTION OF IRON AND AMMONIUM ACETATE.

[MISTURA FERRI ET AMMONII ACETATIS, PHARM. 1880. BASHAM'S MIXTURE.]

Tincture of Ferric Chloride, <i>twenty cubic centimeters</i>	20 Cc.
Diluted Acetic Acid, <i>thirty cubic centimeters</i>	30 Cc.
Solution of Ammonium Acetate, <i>two hundred cubic centimeters</i>	200 Cc.
Aromatic Elixir, <i>one hundred cubic centimeters</i>	100 Cc.
Glycerin, <i>one hundred and twenty cubic centimeters</i>	120 Cc.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

To the Solution of Ammonium Acetate (which should not be alkaline) add, successively, the Diluted Acetic Acid, the Tincture of Ferric Chloride, the Aromatic Elixir, and the Glycerin, and, lastly, enough Water to make the product measure *one thousand* (1000) *cubic centimeters*.

This preparation should be freshly made, when wanted.

LIQUOR FERRI NITRATIS.

SOLUTION OF FERRIC NITRATE.

An aqueous solution of Ferric Nitrate [$\text{Fe}_2(\text{NO}_3)_6 = 483.1$], containing about 6.2 per cent. of the anhydrous salt, and corresponding to about 1.4 per cent. of metallic iron.

Solution of Ferric Sulphate, <i>one hundred and eighty grammes</i>	180 Gm.
Ammonia Water, <i>one hundred and sixty cubic centimeters</i>	160 Cc.
Nitric Acid, <i>seventy-one grammes</i>	71 Gm.
Distilled Water,	
Water, each, <i>a sufficient quantity</i> ,	
To make <i>one thousand grammes</i>	1000 Gm.

Mix the Ammonia Water with *five hundred* (500) *cubic centimeters* of cold Water, and the Solution of Ferric Sulphate with *fifteen hundred* (1500) *cubic centimeters* of cold Water. Add the latter solution slowly to the diluted Ammonia Water, with constant stirring. Let the mixture stand until the precipitate has subsided as far as practicable, and then decant the supernatant liquid. Add to the precipitate *one thousand* (1000) *cubic centimeters* of cold Water, mix well, and again set the mixture aside, as before. Repeat the washing with successive portions of cold Water, in the same manner, until the washings produce but a slight cloudiness with barium chloride test-solution. Pour the washed ferric hydrate on a wet muslin strainer, and let it drain thoroughly. Then transfer it to a porcelain capsule, add the Nitric Acid, and stir with a glass rod, until a clear solution is obtained. Finally, add enough Distilled Water to make the finished product weigh *one thousand* (1000) *grammes*. Filter, if necessary.

A clear, amber-colored or reddish liquid, odorless, having an acid, styptic taste, and an acid reaction.

Specific gravity: about 1.050 at 15° C. (59° F.).

The Solution gives a brownish-red precipitate with ammonia water, and a blue one with potassium ferrocyanide T.S.

If a clear crystal of ferrous sulphate be added to a cooled mixture of equal parts of the Solution and of concentrated sulphuric acid, the crystal will become brown and be surrounded by a brownish-black zone.

If 1.12 (1.1176) Gm. of the Solution be introduced into a glass-stoppered bottle (having a capacity of about 100 Cc.), together with 15 Cc. of water and 2 Cc. of hydrochloric acid, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require about 2.8 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 0.5 per cent. of metallic iron).

LIQUOR FERRI SUBSULPHATIS.

SOLUTION OF FERRIC SUBSULPHATE.

[SOLUTION OF BASIC FERRIC SULPHATE. MONSEL'S SOLUTION.]

An aqueous solution of Basic Ferric Sulphate (of variable chemical composition), corresponding to about 13.6 per cent. of metallic iron.

Ferrous Sulphate, in clear crystals, <i>six hundred and seventy-five grammes</i>	675 Gm.
Sulphuric Acid, <i>sixty-five grammes</i>	65 Gm.
Nitric Acid,	
Distilled Water, each, <i>a sufficient quantity</i> ,	
To make <i>one thousand grammes</i>	1000 Gm.

Add the Sulphuric Acid to *five hundred* (500) *cubic centimeters* of Distilled Water in a capacious porcelain capsule, heat the mixture to nearly 100° C. (212° F.), then add *sixty-five* (65) *grammes* of Nitric Acid, and mix well. Divide the Ferrous Sulphate, coarsely powdered, into four equal portions, and add these portions, one at a time, to the hot liquid, stirring after each addition until effervescence ceases. When all of the Ferrous Sulphate is dissolved, add a few drops of Nitric Acid, and, if this causes a further evolution of red fumes, continue to add Nitric Acid, a few drops at a time, until it no longer causes red fumes to be evolved; then boil the Solution until it assumes a ruby-red color and is free from nitrous odor. Lastly, add enough Distilled Water to make the product weigh *one thousand* (1000) *grammes*. Keep the product in well-stoppered bottles, in a moderately warm place (not under 22° C. or 71.6° F.), protected from light.

This solution will sometimes crystallize, forming a semi-solid, whitish mass. When this occurs, the application of a gentle heat to the bottle will restore the liquid condition.

NOTE.—Solution of Ferric Subsulphate is to be dispensed when Solution of Persulphate of Iron has been prescribed by the physician.

A dark reddish-brown liquid, odorless or nearly so, of an acid, strongly styptic taste, and an acid reaction.

Specific gravity: about 1.550 at 15° C. (59° F.).

Miscible with water and alcohol, in all proportions, without decomposition.

The diluted Solution yields a brownish-red precipitate with ammonia water, a blue one with potassium ferrocyanide T.S., and a white one, insoluble in hydrochloric acid, with barium chloride T.S.

On slowly mixing 2 volumes of the Solution with 1 volume of concentrated sulphuric acid, in a beaker, a semi-solid, white mass will separate on standing (difference from *tersulphate*).

On adding a clear crystal of ferrous sulphate to a cooled mixture of equal volumes of concentrated sulphuric acid and a diluted portion of the Solution, the crystal should not become brown, nor should there be a brownish-black color developed around it (absence of *nitric acid*).

If to a small portion of the Solution, diluted with about 10 volumes of water, a few drops of freshly prepared potassium ferricyanide T.S. be added, a pure brown color should be produced, without a tinge of green or greenish-blue (absence of *ferrous salt*).

If 1.12 (1.1176) Gm. of the Solution be introduced into a glass-stoppered bottle (having a capacity of about 100 Cc.), together with 15 Cc. of water and 2 Cc. of hydrochloric acid, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104°

F.), then cooled, and mixed with a few drops of starch T.S., it should require about 27.2 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 0.5 per cent. of metallic iron).

LIQUOR FERRI TERSULPHATIS.

SOLUTION OF FERRIC SULPHATE.

An aqueous solution of normal Ferric Sulphate [$\text{Fe}_2(\text{SO}_4)_3 = 399.22$], containing about 28.7 per cent. of the salt, and corresponding to about 8 per cent. of metallic iron.

Ferrous Sulphate, in clear crystals, <i>four hundred grammes</i>	400 Gm.
Sulphuric Acid, <i>seventy-eight grammes</i>	78 Gm.
Nitric Acid,	
Distilled Water, each, <i>a sufficient quantity</i> ,	

To make *one thousand grammes* . . . 1000 Gm.

Add the Sulphuric Acid to *two hundred* (200) *cubic centimeters* of Distilled Water in a capacious porcelain capsule, heat the mixture to nearly 100° C. (212° F.), then add *fifty-five* (55) *grammes* of Nitric Acid, and mix well. Divide the Ferrous Sulphate, coarsely powdered, into four equal portions, and add these portions, one at a time, to the hot liquid, stirring after each addition until effervescence ceases. When all of the Ferrous Sulphate is dissolved, add a few drops of Nitric Acid, and, if this causes a further evolution of red fumes, continue to add Nitric Acid, a few drops at a time, until it no longer causes red fumes to be evolved; then boil the Solution until it assumes a reddish-brown color and is free from nitrous odor. Lastly, add enough Distilled Water to make the product weigh *one thousand* (1000) *grammes*. Filter, if necessary.

A dark reddish-brown liquid, almost odorless, having an acid, strongly styptic taste, and an acid reaction.

Specific gravity: about 1.320 at 15° C. (59° F.).

Miscible with water and alcohol, in all proportions, without decomposition.

The diluted Solution yields a brownish-red precipitate with ammonia water, a blue one with potassium ferrocyanide T.S., and a white one, insoluble in hydrochloric acid, with barium chloride T.S.

On slowly mixing 2 volumes of the Solution with 1 volume of concentrated sulphuric acid, in a beaker, no solid, white mass will separate on standing (difference from *subsulphate*).

On adding a clear crystal of ferrous sulphate to a cooled mixture of equal volumes of concentrated sulphuric acid and a moderately diluted portion of the Solution, the crystal should not become brown, nor should there be a brownish-black color developed around it (absence of *nitric acid*).

If to a small portion of the Solution, diluted with about 10 volumes of water, a few drops of freshly prepared potassium ferrieyanide T.S. be added, a pure brown color should be produced, without a tinge of green or greenish-blue (absence of *ferrous salt*).

If 1.12 (1.1176) Gm. of the Solution be introduced into a glass-stoppered bottle (having a capacity of about 100 Cc.), together with 15 Cc. of water and 2 Cc. of hydrochloric acid, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require about 16 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 0.5 per cent. of metallic iron).

LIQUOR HYDRARGYRI NITRATIS.

SOLUTION OF MERCURIC NITRATE.

A liquid containing about 60 per cent. of Mercuric Nitrate [$\text{Hg}(\text{NO}_3)_2 = 323.58$], together with about 11 per cent. of free Nitric Acid.

Red Mercuric Oxide, <i>forty grammes</i>	40 Gm.
Nitric Acid, <i>forty-five grammes</i>	45 Gm.
Distilled Water, <i>fifteen grammes</i>	15 Gm.

To make *one hundred grammes*.... 100 Gm.

Mix the Nitric Acid with the Distilled Water, and dissolve the Red Mercuric Oxide in the mixture.

Keep the product in glass-stoppered bottles.

A clear, nearly colorless, heavy liquid, having a faint odor of nitric acid, and a strongly acid reaction.

Specific gravity: about 2.100 at 15° C. (59° F.).

On evaporating a few drops of the Solution in a porcelain capsule, a white residue is left, which, on being heated, becomes successively yellow, red, and brown, and is finally completely volatilized.

On a bright surface of copper, the Solution deposits a coating of metallic mercury.

The Solution, diluted with water, yields with potassium or sodium hydrate T.S. a yellow precipitate; and with potassium iodide T.S. a bright red one, soluble in an excess of the reagent.

A clear crystal of ferrous sulphate dropped into the Solution rapidly acquires a brown color, and becomes surrounded by a brownish-black zone.

No precipitation or cloudiness should occur in the Solution on the addition of water, or of diluted hydrochloric acid (absence of *mercurous salt*).

LIQUOR IODI COMPOSITUS.

COMPOUND SOLUTION OF IODINE.

[LUGOL'S SOLUTION.]

Iodine, <i>five grammes</i>	5 Gm.
Potassium Iodide, <i>ten grammes</i>	10 Gm.
Distilled Water, <i>a sufficient quantity</i> ,	

To make *one hundred grammes*.... 100 Gm.

Dissolve the Iodine and Potassium Iodide in a sufficient quantity of Distilled Water to make the product weigh *one hundred (100) grammes*.

Keep the Solution in glass-stoppered bottles.

If 12.66 Gm. of the Solution be mixed with a few drops of starch T.S., it should require, for complete decoloration, from 49.3 to 50 Cc. of decinormal sodium hyposulphite V.S. (each Cc. of the volumetric solution corresponding to 0.1 per cent. of iodine).

LIQUOR MAGNESII CITRATIS.

SOLUTION OF MAGNESIUM CITRATE.

Magnesium Carbonate, <i>fifteen grammes</i>	15	Gm.
Citric Acid, <i>thirty grammes</i>	30	Gm.
Syrup of Citric Acid, <i>sixty cubic centimeters</i>	60	Cc.
Potassium Bicarbonate, <i>two and one-half grammes</i>	2.5	Gm.
Water, <i>a sufficient quantity</i> .		

Dissolve the Citric Acid in *one hundred and twenty* (120) *cubic centimeters* of Water, and, having added the Magnesium Carbonate, stir, until it is dissolved. Filter the solution into a strong bottle of the capacity of about *three hundred and sixty* (360) *cubic centimeters*, containing the Syrup of Citric Acid. Then add enough Water to nearly fill the bottle, drop in the Potassium Bicarbonate, immediately close the bottle with a cork, and secure it with twine. Lastly, shake the mixture occasionally, until the Potassium Bicarbonate is dissolved.

LIQUOR PLUMBI SUBACETATIS.

SOLUTION OF LEAD SUBACETATE.

An aqueous liquid, containing in solution about 25 per cent. of Lead Subacetate [approximately $\text{Pb}_2\text{O}(\text{C}_2\text{H}_3\text{O}_2)_2 = 546.48$].

Lead Acetate, <i>one hundred and seventy grammes</i>	170	Gm.
Lead Oxide, <i>one hundred grammes</i>	100	Gm.
Distilled Water, <i>a sufficient quantity</i> ,		

To make *one thousand grammes* 1000 Gm.

Dissolve the Lead Acetate in *eight hundred* (800) *grammes* of boiling Distilled Water, in a glass or porcelain vessel. Then add the Lead Oxide, previously passed through a fine sieve, and boil for half an hour, occasionally adding hot Distilled Water to make up the loss by evaporation. Remove the heat, allow the liquid to cool, and add enough Distilled Water, previously boiled and cooled, to make the product weigh *one thousand* (1000) *grammes*. Finally, filter the liquid in a closely-covered funnel.

Keep the product in well-stoppered bottles.

A clear, colorless liquid, odorless, having a sweetish, astringent taste, and an alkaline reaction. On exposure to the air it absorbs carbon dioxide, which causes the formation of a white precipitate.

Specific gravity : about 1.195 at 15° C. (59° F.).

When Solution of Lead Subacetate is added to a solution of acacia, it produces a dense, white precipitate (distinction from an aqueous solution of *normal lead acetate*).

In other respects the Solution conforms to the reactions and tests given under Lead Acetate (see *Plumbi Acetas*).

If 13.67 Gm. of the Solution be diluted with 50 Cc. of water, there will be required, for complete precipitation of the lead, about 25 Cc. of normal sulphuric acid (each Cc. corresponding to 1 per cent. of Lead Subacetate), methyl-orange being used as indicator.

Preparations : Ceratum Plumbi Subacetatis. Liquor Plumbi Subacetatis Dilutus.

LIQUOR PLUMBI SUBACETATIS DILUTUS. DILUTED SOLUTION OF LEAD SUBACETATE.

[LEAD WATER.]

Solution of Lead Subacetate, <i>thirty cubic centimeters</i>	30 Cc.
Distilled Water, <i>a sufficient quantity</i> ,	

To make <i>one thousand cubic centimeters</i>	1000 Cc.
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Mix the Solution of Lead Subacetate with enough Distilled Water, previously boiled and cooled, to make the product measure *one thousand* (1000) *cubic centimeters*.

Keep the Solution in well-stoppered bottles.

LIQUOR POTASSÆ. SOLUTION OF POTASSA.

[SOLUTION OF POTASSIUM HYDRATE.]

An aqueous solution of Potassium Hydrate [$\text{KOH} = 55.99$], containing about 5 per cent. of the hydrate.

Potassium Bicarbonate, <i>eighty-five grammes</i>	85 Gm.
Lime, <i>forty grammes</i>	40 Gm.
Distilled Water, <i>a sufficient quantity</i> .	

Dissolve the Potassium Bicarbonate in *four hundred* (400) *cubic centimeters* of Distilled Water, heat the solution until effervescence ceases, and then increase the heat to the boiling point of the liquid. Slake the Lime with about *twenty* (20) *cubic centimeters* of Distilled Water, then mix it well with *four hundred* (400) *cubic centimeters* of Distilled Water, pour the mixture into a tared flask, and, having heated it to boiling, gradually add to it the solution of Potassium Bicarbonate, and boil during ten minutes. Then add enough Distilled Water to

the flask to make the contents weigh *one thousand* (1000) *grammes*, and set the flask aside, well stoppered, until the contents are cold. Lastly, strain the liquid through linen, set it aside in a well-stoppered bottle until it has become clear by subsidence, and separate the clear solution by decantation, or by means of a siphon.

Solution of Potassa may also be prepared in the following manner :

Potassa, <i>fifty-six grammes</i>	56 Gm.
Distilled Water, <i>nine hundred and forty-four grammes</i> ...	944 Gm.

To make *one thousand grammes*. . . . 1000 Gm.

Dissolve the Potassa in the Distilled Water.

The Potassa used in this process should be of the full strength directed by the Pharmacopœia (90 per cent.). Potassa of any other strength, however, may be used, if a proportionately larger or smaller quantity be taken ; the proper amount for the above formula being ascertained by dividing 5000 by the percentage of absolute Potassa (potassium hydrate) contained therein.

Solution of Potassa should be kept in bottles made of green glass, and provided with glass stoppers coated with paraffin or petrolatum.

A clear, colorless liquid, odorless, having a very acrid and caustic taste, and a strongly alkaline reaction.

Specific gravity : about 1.036 at 15° C. (59° F.).

It should conform to the same reactions and tests as an aqueous solution of Potassa (see *Potassa*).

To neutralize 28 Gm. of Solution of Potassa should require about 25 Cc. of normal sulphuric acid (each Cc. of the volumetric solution indicating 0.2 per cent. of absolute potassium hydrate), phenolphthalein being used as indicator.

LIQUOR POTASSII ARSENITIS.

SOLUTION OF POTASSIUM ARSENITE.

[FOWLER'S SOLUTION.]

Arsenous Acid, in fine powder, <i>ten grammes</i>	10 Gm.
Potassium Bicarbonate, <i>twenty grammes</i>	20 Gm.
Compound Tincture of Lavender, <i>thirty cubic centimeters</i>	30 Cc.
Distilled Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Boil the Arsenous Acid and Potassium Bicarbonate with *one hundred* (100) *cubic centimeters* of Distilled Water, until solution has been effected. Then add enough Distilled Water to make the solution, when cold, measure *nine hundred and seventy* (970) *cubic centimeters*,

and, lastly, add the Compound Tincture of Lavender. Filter through paper.

If 24.7 Cc. of the Solution be boiled for a few minutes with 2 Gm. of sodium bicarbonate, and the liquor, when cold, diluted with water to 100 Cc., and mixed with a little starch T.S., it should require from 49.4 to 50 Cc. of decinormal iodine V.S. to produce the blue tint of iodide of starch (corresponding to 1 Gm. of arsenous acid in 100 Cc. of the Solution).

LIQUOR POTASSII CITRATIS.

SOLUTION OF POTASSIUM CITRATE.

[MISTURA POTASSII CITRATIS.]

An aqueous liquid, containing in solution about 9 per cent. of anhydrous Potassium Citrate [$K_3C_6H_5O_7 = 305.63$], together with small amounts of citric and carbonic acids.

Potassium Bicarbonate, *eight grammes* 8 Gm.
Citric Acid, *six grammes* 6 Gm.
Water, *a sufficient quantity*.

Dissolve the Potassium Bicarbonate and the Citric Acid, each, in *forty (40) cubic centimeters* of Water. Filter the solutions separately, and wash the filters with enough Water to obtain, in each case, *fifty (50) cubic centimeters*. Finally, mix the two solutions, and, when effervescence has nearly ceased, transfer the liquid to a bottle.

This preparation should be freshly made, when wanted.

A clear, colorless liquid, odorless, having a mildly saline taste, and a slightly acid reaction.

It should conform to the reactions and tests of Potassium Citrate (see *Potassii Citras*).

LIQUOR SODÆ.

SOLUTION OF SODA.

[SOLUTION OF SODIUM HYDRATE.]

An aqueous solution of Sodium Hydrate [$NaOH = 39.96$], containing about 5 per cent. of the hydrate.

Sodium Carbonate, *one hundred and seventy grammes* 170 Gm.
Lime, *fifty grammes* 50 Gm.
Distilled Water, *a sufficient quantity*.

Dissolve the Sodium Carbonate in *four hundred (400) cubic centimeters* of boiling Distilled Water. Slake the Lime with about *thirty (30) cubic centimeters* of Distilled Water, then mix it well with *four hundred (400) cubic centimeters* of Distilled Water, pour the mixture into a tared flask, and, having heated it to boiling, gradually add to it the solu-

tion of Sodium Carbonate, and boil during ten minutes. Then add enough Distilled Water to the flask to make the contents weigh *one thousand* (1000) *grammes*, and set the flask aside, well stoppered, until the contents are cold. Lastly, strain the liquid through linen, set it aside in a well-stoppered bottle until it has become clear by subsidence, and separate the clear solution by decantation, or by means of a siphon.

Solution of Soda may also be prepared in the following manner :

Soda, <i>fifty-six grammes</i>	56 Gm.
Distilled Water, <i>nine hundred and forty-four grammes</i> ...	944 Gm.
<hr/>	
To make <i>one thousand grammes</i>	1000 Gm.

Dissolve the Soda in the Distilled Water.

The Soda used in this process should be of the full strength directed by the Pharmacopœia (90 per cent.). Soda of any other strength, however, may be used, if a proportionately larger or smaller quantity be taken ; the proper amount for the above formula being ascertained by dividing 5000 by the percentage of absolute Soda (sodium hydrate) contained therein.

Solution of Soda should be kept in bottles made of green glass, and provided with glass stoppers coated with paraffin or petrolatum.

A clear, colorless liquid, odorless, having a very acrid and caustic taste, and a strongly alkaline reaction.

Specific gravity : about 1.059 at 15° C. (59° F.).

It should conform to the same reactions and tests as an aqueous solution of Soda (see *Soda*).

To neutralize 20 Gm. of Solution of Soda should require about 25 Cc. of normal sulphuric acid (each Cc. of the volumetric solution indicating 0.2 per cent. of absolute sodium hydrate), phenolphthalein being used as indicator.

LIQUOR SODÆ CHLORATÆ.

SOLUTION OF CHLORINATED SODA.

[LABARRAQUE'S SOLUTION.]

An aqueous solution of several chlorine-compounds of sodium, containing at least 2.6 per cent., by weight, of available chlorine.

Sodium Carbonate, <i>one hundred and fifty grammes</i>	150 Gm.
Chlorinated Lime, <i>seventy-five grammes</i>	75 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand grammes*.... 1000 Gm.

Triturate the Chlorinated Lime with *two hundred* (200) *cubic centimeters* of Water, gradually added, until a uniform mixture results. Allow the heavier particles to subside, and transfer the thinner,

supernatant portion to a filter. Then triturate the residue again with *two hundred (200) cubic centimeters* of Water, transfer the whole to the filter, and when the liquid has drained off, wash the filter and contents with *one hundred (100) cubic centimeters* of Water. Dissolve the Sodium Carbonate in *three hundred (300) cubic centimeters* of hot Water, and add this solution to the previously obtained filtrate contained in a suitable vessel. Stir or shake the mixture thoroughly, and, if it should become gelatinous, warm the vessel until the contents liquefy. Then transfer the mixture to a new filter, and, when no more liquid drains from it, wash the filter and contents with enough Water to make the product weigh *one thousand (1000) grammes*.

Keep the solution in well-stoppered bottles, protected from light.

A clear, pale greenish liquid, having a faint odor of chlorine, and a disagreeable, alkaline taste.

Specific gravity : about 1.052 at 15° C. (59° F.).

The Solution at first colors red litmus paper blue, and then bleaches it.

The addition of hydrochloric acid to the Solution causes an effervescence of chlorine and carbonic acid gas.

If 6.7 (6.74) Gm. of the Solution be mixed with 50 Cc. of water, then 2 Gm. of potassium iodide and 10 Cc. of hydrochloric acid added, together with a few drops of starch T.S., it should require not less than 50 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish tint of the liquid (each Cc. of the volumetric solution corresponding to 0.052 per cent. of available chlorine).

LIQUOR SODII ARSENATIS.

SOLUTION OF SODIUM ARSENATE.

Sodium Arsenate, deprived of its water of crystallization by a heat not exceeding 149° C. (300.2° F.), *one*

gramme 1 Gm.

Distilled Water, *a sufficient quantity*,

To make *one hundred cubic centimeters*.... 100 Cc.

Dissolve the Sodium Arsenate in a sufficient quantity of Distilled Water to make *one hundred (100) cubic centimeters*.

The Solution conforms to the reactions and tests of Sodium Arsenate (see *Sodii Arsenas*).

LIQUOR SODII SILICATIS.

SOLUTION OF SODIUM SILICATE.

Solution of Sodium Silicate should be kept in well-stoppered bottles.

A semi-transparent, almost colorless, or yellowish, or pale greenish-yellow, viscid liquid, odorless, having a sharp, saline, and alkaline taste, and an alkaline reaction.

Specific gravity : 1.300 to 1.400 at 15° C. (59° F.).

A drop of the Solution, when held in a non-luminous flame, imparts to it an intensely yellow color.

If a portion of the Solution, largely diluted with water, be supersaturated with nitric acid, a gelatinous or pulverulent, white precipitate of silicic hydrate will be produced.

LIQUOR ZINCI CHLORIDI.

SOLUTION OF ZINC CHLORIDE.

An aqueous solution of Zinc Chloride [$\text{ZnCl}_2 = 135.84$], containing about 50 per cent., by weight, of the salt.

Zinc, granulated, <i>two hundred and forty grammes</i>	240 Gm.
Hydrochloric Acid, <i>eight hundred and forty grammes</i>	840 Gm.
Nitric Acid, <i>twelve grammes</i>	12 Gm.
Precipitated Zinc Carbonate, <i>twelve grammes</i>	12 Gm.
Distilled Water, <i>a sufficient quantity</i> .	

To the Zinc, contained in a glass or porcelain vessel, add *one hundred and fifty* (150) *cubic centimeters* of Distilled Water; then gradually add the Hydrochloric Acid, and digest, until the Acid is saturated. Pour off the solution, add the Nitric Acid, evaporate the solution to dryness, and heat the dry mass to fusion at a temperature not exceeding 115°C . (239°F .). Let it cool, and dissolve it in a sufficient amount of Distilled Water to make the product weigh *one thousand* (1000) *grammes*. Then add the Precipitated Zinc Carbonate, agitate the mixture occasionally during twenty-four hours, and then set it aside until it has become clear by subsidence. Finally, separate the clear solution by decantation, or by means of a siphon.

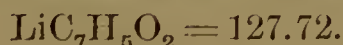
A clear, colorless liquid, odorless, having a very astringent, sweetish taste, and an acid reaction.

Specific gravity: about 1.535 at 15°C . (59°F .).

It conforms to the reactions and tests of an aqueous solution of Zinc Chloride (see *Zinci Chloridum*).

LITHII BENZOAS.

LITHIUM BENZOATE.



A light, white powder, or small, shining, crystalline scales; odorless, or of faint benzoïn-like odor, and of a cooling, sweetish taste; permanent in the air.

Soluble, at 15°C . (59°F .), in 4 parts of water, and in 12 parts of alcohol; in 2.5 parts of boiling water, and in 10 parts of boiling alcohol. The presence of sodium benzoate increases the solubility in water and lessens that in alcohol.

When heated, the salt fuses; at a higher temperature it chars, emits inflammable vapors having a benzoïn-like odor, and finally leaves a residue of lithium carbonate mixed with carbon. This residue imparts a crimson color to a non-luminous flame, and its aqueous solution has an alkaline reaction upon litmus paper.

The aqueous solution (1 in 20) of Lithium Benzoate has a faintly acid reaction upon litmus.

If 2 Cc. of ferric chloride T.S. be mixed with a small drop of ammonia water, and added to 2 Cc. of an aqueous solution of the salt, a voluminous brownish-pink precipitate of basic ferric benzoate will result.

If 1 Cc. of diluted nitric acid be added to 0.2 Gm. of Lithium Benzoate dissolved in 2 Cc. of water, and the precipitated benzoic acid be removed by filtration, the clear filtrate should not be rendered turbid on addition of silver nitrate T.S. (absence of *chloride*), or of barium nitrate T.S. (absence of *sulphate*).

If a concentrated solution of the salt be mixed with hydrochloric acid, a white precipitate of benzoic acid will be formed, which, after being separated from the liquid, and thoroughly washed and dried, should respond to the tests of purity given under *Acidum Benzoicum*.

If the filtrate from this precipitate be evaporated to dryness and ignited, 1 part of the residue should be soluble in 5 parts of absolute alcohol. If to this alcoholic solution an equal volume of ether be added, no precipitate or turbidity should appear (limit of *other alkalies*).

The aqueous solution (1 in 20) of the salt should remain unaffected by hydrogen sulphide T.S., or ammonium sulphide T.S. (absence of *arsenic*, *lead*, *iron*, *aluminum*, etc.), or by ammonium oxalate T.S. (absence of *calcium*), or by sodium cobaltic nitrite T.S. (limit of *potassium*); nor should silver nitrate T.S., or barium nitrate T.S., produce in it more than a very slight turbidity (limit of *chloride* and *sulphate*).

If 1 Gm. of dry Lithium Benzoate be thoroughly ignited in a porcelain crucible, so as to burn off most of the carbonaceous matter, and the residue be mixed with 20 Cc. of water, it should require, for complete neutralization, not less than 7.8 Cc. of normal sulphuric acid (corresponding to not less than 99.6 per cent. of the pure salt), methyl-orange being used as indicator.

LITHII BROMIDUM.

LITHIUM BROMIDE.



Lithium Bromide should be kept in well-stoppered bottles.

A white, granular salt, odorless, and having a sharp, slightly bitter taste; very deliquescent.

Soluble, at 15° C. (59° F.), in 0.6 part of water, and in 0.3 part of boiling water; very soluble in alcohol; also soluble in ether.

At a low red heat the salt fuses, and at a higher heat it is slowly volatilized. It imparts a crimson color to a non-luminous flame.

The aqueous solution is neutral to litmus paper.

If a few drops of chloroform be added to 5 Cc. of the solution (1 in 20), then 1 Cc. of chlorine water, and the mixture shaken, the liberated bromine will dissolve in the chloroform, communicating to it a yellow or yellowish-brown color.

If 0.5 Cc. of sodium cobaltic nitrite T.S. be added to 5 Cc. of the aqueous solution, no precipitate or turbidity should occur within 10 minutes (limit of *potassium*).

One part of the salt should dissolve, without residue, in 5 parts of absolute alcohol, and the addition of an equal volume of ether should produce no precipitate in this solution (limit of *other alkalies*).

The aqueous solution (1 in 20) should not be affected by hydrogen sulphide T.S. either before or after acidulation with a drop of hydrochloric acid (absence of *arsenic*, *lead*, *copper*, etc.), nor by ammonium sulphide T.S. (absence of *iron*, *aluminum*, etc.).

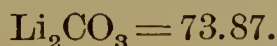
In the aqueous solution no turbidity should be produced by the addition of barium chloride T.S. (absence of *sulphate*).

If a few drops of starch T.S. be added to 5 Cc. of the aqueous solution, and then a drop or two of chlorine water, no blue color should appear (absence of *iodide*).

If 0.3 Gm. of dry Lithium Bromide be dissolved in 10 Cc. of water and 2 drops of potassium chromate T.S. be added, it should require 35.3 Cc. of decinormal silver nitrate V.S. to produce a permanent red color of silver chromate (corresponding to at least 98 per cent. of the pure salt).

LITHII CARBONAS.

LITHIUM CARBONATE.



A light, white powder, odorless, and having an alkaline taste; permanent in the air.

Soluble in 80 parts of water at 15° C. (59° F.), and in 140 parts of boiling water; much more soluble in water saturated with carbon dioxide; insoluble in alcohol; soluble in diluted acids with active effervescence.

At a low red heat the salt fuses; at a higher temperature it loses some of its carbon dioxide, and is partially converted into lithium oxide. It imparts a crimson color to a non-luminous flame,

The aqueous solution has an alkaline reaction upon litmus paper.

If 1 Gm. of Lithium Carbonate be dissolved in 40 Cc. of diluted acetic acid, no insoluble residue should remain.

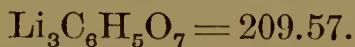
Separate portions of this solution should not be affected by the following reagents: hydrogen sulphide T.S. (absence of *arsenic*, *lead*, etc.); ammonium sulphide T.S. (absence of *iron*, *aluminum*, etc.); ammonium oxalate T.S. (*calcium*); silver nitrate T.S. (*chloride*); barium chloride T.S. (*sulphate*); or sodium cobaltic nitrite T.S. (limit of *potassium*).

If 0.5 Gm. of Lithium Carbonate be dissolved in 2 Cc. of hydrochloric acid, and the clear solution be evaporated to dryness, the dry residue should completely dissolve in 3 Cc. of absolute alcohol, and an addition of 3 Cc. of ether should not render the solution turbid (limit of *other alkalies*).

If 0.5 Gm. of the dry salt be mixed with 20 Cc. of water, it should require, for complete neutralization, not less than 13.4 Cc. of normal sulphuric acid (corresponding to at least 98.98 per cent. of the pure salt), methyl-orange being used as indicator.

LITHII CITRAS.

LITHIUM CITRATE.



Lithium Citrate should be kept in well-stoppered bottles.

A white powder, odorless, and having a cooling, faintly alkaline taste; deliquescent on exposure to air.

Soluble in 2 parts of water at 15° C. (59° F.), and in 0.5 part of boiling water; almost insoluble in alcohol or ether.

At a red heat the salt chars, emits inflammable vapors of a pungent odor, and finally leaves a black residue of lithium carbonate mixed with carbon. It imparts a crimson color to a non-luminous flame.

The aqueous solution is neutral to litmus paper.

If the aqueous solution (1 in 20) of Lithium Citrate be boiled with an equal volume of calcium chloride T.S., a white precipitate will be deposited.

Separate portions of the solution, slightly acidulated with acetic acid, should not be affected by hydrogen sulphide T.S. (absence of *arsenic, lead, etc.*); ammonium sulphide T.S. (*iron, aluminum, etc.*); ammonium oxalate T.S. (*calcium*); or sodium cobaltic nitrite T.S. (limit of *potassium*).

With barium nitrate T.S., or with silver nitrate T.S., not more than a slight turbidity should appear (limit of *sulphate* and of *chloride*).

If the residue obtained by calcining the salt at a red heat be dissolved in a slight excess of diluted hydrochloric acid, and the filtrate evaporated to dryness, a portion of the residue, treated with 5 parts of absolute alcohol, should completely dissolve, and the addition of an equal volume of ether should not render the solution turbid (limit of *other alkalies*).

If 1 Gm. of dry Lithium Citrate be thoroughly ignited in a porcelain crucible, so as to burn off most of the carbonaceous matter, and the residue be mixed with 20 Cc. of water, it should require, for complete neutralization, not less than 14.2 Cc. of normal sulphuric acid (corresponding to at least 99.2 per cent. of the pure salt), methyl-orange being used as indicator.

LITHII CITRAS EFFERVESCENS.

EFFERVESCENT LITHIUM CITRATE.

Lithium Carbonate, <i>seventy grammes</i>	70 Gm.
Sodium Bicarbonate, <i>two hundred and eighty grammes</i> ..	280 Gm.
Citric Acid, <i>three hundred and seventy grammes</i>	370 Gm.
Sugar, in fine powder, <i>a sufficient quantity</i> ,	

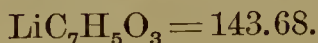
To make *one thousand grammes*.... 1000 Gm.

Triturate the Citric Acid with about *two hundred* (200) *grammes* of Sugar, and dry the mixture thoroughly. Then incorporate with it, by trituration, the Lithium Carbonate and Sodium Bicarbonate, and enough Sugar to make the product weigh *one thousand* (1000) *grammes*.

Keep the powder in well-stoppered bottles.

LITHII SALICYLAS.

LITHIUM SALICYLATE.



Lithium Salicylate should be kept in well-stoppered bottles.

A white or grayish-white powder, odorless, and having a sweetish taste; deliquescent on exposure to air.

Very soluble in water and in alcohol.

When heated, the salt is decomposed, emitting the odor of phenol, and finally leaving a residue of lithium carbonate and carbon. It imparts a crimson color to a non-luminous flame.

The aqueous solution slightly reddens blue litmus paper.

If copper sulphate T.S. be added to an aqueous solution (1 in 20) of the salt, the mixture should have a bright green color.

If a small quantity of ferric chloride T.S. be added to an excess of a concentrated, aqueous solution (1 in 4) of Lithium Salicylate, a deep red color will be produced, which, after the liquid is largely diluted and mixed with more ferric chloride T.S., will change to a deep bluish-violet tint.

Upon adding to 1 Gm. of the salt, in a test-tube, about 1 Cc. of concentrated sulphuric acid, then, cautiously, in drops, about 1 Cc. of methylic alcohol, and heating the mixture to boiling, the odor of oil of gaultheria will be evolved.

Hydrochloric or sulphuric acid produces in the aqueous solution a voluminous precipitate of salicylic acid, which, when separated and washed, should conform to the reactions and tests given under *Acidum Salicylicum*.

The aqueous solution should be colorless (absence of *iron* and *organic coloring matters*), and should not effervesce on the addition of diluted acids (absence of *carbonate*).

If 1 part of the salt be agitated with 15 parts of sulphuric acid, no color should be imparted to the acid within 15 minutes (absence of *readily carbonizable*, *organic impurities*).

If a portion of the residue, left after ignition, be dissolved in diluted acetic acid, separate portions of the filtrate should not be rendered turbid on the addition of a few drops of barium chloride T.S. (absence of *sulphate*), nor be rendered more than very slightly turbid by silver nitrate T.S. (limit of *chloride*).

Other portions of the same filtrate should not be affected by hydrogen sulphide T.S. (absence of *arsenic*, *lead*, etc.); nor by ammonium sulphide T.S. (*aluminum*, etc.); nor by ammonium oxalate T.S. (*calcium*); nor by sodium cobaltic nitrite T.S. (limit of *potassium*).

If another portion of the residue, left after ignition, be dissolved in diluted hydrochloric acid, and the filtrate evaporated to dryness, a portion of the residue, when treated with 5 parts of absolute alcohol, should completely dissolve, and the addition of an equal volume of ether should not render the solution turbid (limit of *other alkalies*).

If 2 Gm. of dry Lithium Salicylate be thoroughly ignited in a porcelain crucible, so as to burn off most of the carbonaceous matter, and the residue be mixed with 20 Cc. of water, it should require, for complete neutralization, not less than 13.8 Cc. of normal sulphuric acid (corresponding to at least 99.13 per cent. of the pure salt), methyl-orange being used as indicator.

LOBELIA.

LOBELIA.

The leaves and tops of *Lobelia inflata* Linné (nat. ord. *Lobeliaceæ*), collected after a portion of the capsules have become inflated.

Leaves alternate, petiolate, the upper ones sessile, ovate or oblong, about 5 Cm. long, irregularly toothed, pubescent, pale green; branches hairy, terminating in long racemes of small, pale blue flowers, having an adherent five-toothed calyx, which is inflated in fruit, a bilabiate corolla, and five united stamens; odor slight, irritating; taste mild, afterwards burning and acrid.

Preparations: Extractum Lobeliæ Fluidum. Tinctura Lobeliæ.

LUPULINUM.

LUPULIN.

The glandular powder separated from the strobiles of *Humulus Lupulus* Linné (nat. ord. *Urticaceæ*).

Bright brownish-yellow, becoming yellowish-brown, resinous, consisting of minute granules, which, as seen under the microscope, are subglobular, or rather hood-shaped, and reticulate; aromatic and bitter.

When Lupulin is agitated with water and the mixture allowed to stand, no considerable sediment (sand, etc.) should be deposited. When ignited, Lupulin should not leave more than 10 per cent. of ash.

Preparations: Extractum Lupulini Fluidum. Oleoresina Lupulini.

LYCOPODIUM.

LYCOPODIUM.

The spores of *Lycopodium clavatum* Linné, and of other species of *Lycopodium* (nat. ord. *Lycopodiaceæ*).

A fine powder, pale yellowish, very mobile, inodorous, tasteless, floating upon water and not wetted by it, but sinking on being boiled with it, and burning quickly when thrown into a flame. Under the microscope the spores are seen to be sphaero-tetrahedral, the surfaces marked with reticulated ridges, and the edges beset with short projections.

Lycopodium should be free from pollen, starch, sand, and other impurities, any of which are easily detected by means of the microscope.

When ignited with free access of air. *Lycopodium* should not leave more than 5 per cent. of ash.

MACIS.

MACE.

The arillode of the seed of *Myristica fragrans* Houttuyn (nat. ord. *Myristicaceæ*).

In narrow bands, 25 Mm. or more long, somewhat branched and lobed above, united into broader bands below; brownish-orange; fatty when scratched or pressed; odor fragrant, taste warm and aromatic.

MAGNESIA.

MAGNESIA.

$\text{MgO} = 40.26.$

[LIGHT MAGNESIA. CALCINED MAGNESIA.]

Magnesia should be kept in well-closed vessels.

A white, very light, and very fine powder, without odor, and having an earthy, but not a saline, taste. On exposure to the air, it slowly absorbs moisture and carbon dioxide.

Almost insoluble in water, and insoluble in alcohol, but soluble in dilute acids.

It is not altered by heat, but when very strongly heated its density is increased.

When moistened with water, it has a faintly alkaline reaction upon litmus paper.

On stirring 1 part of Magnesia with 15 parts of water, in a beaker, and allowing the mixture to stand for about half an hour, it will form a gelatinous mass of sufficient consistence to prevent it from dropping out when the glass is inverted.

A filtered solution of Magnesia in diluted sulphuric acid, mixed with ammonium chloride T.S. and an excess of ammonia water, yields, with sodium phosphate T.S., a white, crystalline precipitate.

If a mixture of 0.2 Gm. of Magnesia with 10 Cc. of water be heated to boiling, and, after cooling, 5 Cc. of the supernatant liquid be filtered off, this filtrate should not give more than a faintly alkaline reaction with litmus paper, and, when evaporated to dryness, should not leave more than a very slight residue (limit of foreign soluble salts).

The Magnesia mixed with water remaining from the preceding test, when poured into 5 Cc. of acetic acid, should dissolve without the evolution of more than a few isolated gas bubbles (limit of *carbonate*).

This latter solution, when filtered, should not be rendered more than slightly opalescent by ammonium oxalate T.S. (limit of *calcium*), or by barium chloride T.S. (limit of *sulphate*), or, after the addition of a few drops of nitric acid, by silver nitrate T.S. (limit of *chloride*).

If 0.4 Gm. of Magnesia be dissolved in 10 Cc. of diluted hydrochloric acid, the solution should be colorless, and should not be affected by hydrogen sulphide T.S., nor, after the addition of a slight excess of ammonia water, should it be immediately affected by ammonium sulphide T.S. (absence of *metallic impurities*).

If Magnesia be exposed to a low red heat in a porcelain crucible, it should not lose more than 5 per cent. of its weight (limit of *water of hydration*).

Preparation: Pulvis Rhei Compositus.

MAGNESIA PONDEROSA.

HEAVY MAGNESIA.



A white, dense, and very fine powder, which should conform to the reactions and tests given under *Magnesia*.

It differs, however, from the latter in not readily uniting with water to form a gelatinous hydrate.

MAGNESII CARBONAS.

MAGNESIUM CARBONATE.



Light, white, friable masses, or a light, white powder, without odor, and having a slightly earthy taste; permanent in the air.

Almost insoluble in water, to which, however, it imparts a slightly alkaline reaction; insoluble in alcohol, but soluble in dilute acids with active effervescence.

When strongly heated, the salt loses water and carbon dioxide, and is converted into magnesia.

A filtered solution of the salt in diluted sulphuric acid, when mixed with ammonium chloride T.S. and an excess of ammonia water, yields, with sodium phosphate T.S., a white, crystalline precipitate.

If the salt be boiled with water, the filtered liquid, when evaporated to dryness, should not leave more than a very slight residue.

A 2-per-cent. solution of the salt, prepared by the addition of acetic acid, should not be rendered more than slightly opalescent by ammonium oxalate T.S. (limit of *calcium*); nor by barium chloride T.S. (limit of *sulphate*); nor, after the addition of a few drops of nitric acid, by silver nitrate T.S. (limit of *chloride*).

If 0.4 Gm. of the salt be dissolved in 5 Cc. of diluted hydrochloric acid, the solution should be colorless, and should not be affected by hydrogen sulphide T.S., nor, after the addition of an excess of ammonia water, should it be immediately affected by ammonium sulphide T.S. (absence of *metallic impurities*).

If 1.0 Gm. of the salt be ignited in a porcelain crucible, the residue should weigh not less than 0.4 Gm.

MAGNESII CITRAS EFFERVESCENS.

EFFERVESCENT MAGNESIUM CITRATE.

Magnesium Carbonate, <i>ten grammes</i>	10 Gm.
Citric Acid, <i>forty-six grammes</i>	46 Gm.
Sodium Bicarbonate, <i>thirty-four grammes</i>	34 Gm.
Sugar, in fine powder, <i>eight grammes</i>	8 Gm.
Alcohol,	
Distilled Water, each, <i>a sufficient quantity</i> .	

Mix the Magnesium Carbonate intimately with *thirty* (30) *grammes* of Citric Acid and *four* (4) *cubic centimeters* of Distilled Water, so as to form a thick paste. Dry this at a temperature not exceeding 30° C. (86° F.), and reduce it to a fine powder. Then mix it intimately with the Sugar, the Sodium Bicarbonate, and the remainder of the Citric Acid previously reduced to a very fine powder. Dampen the powder with a sufficient quantity of Alcohol, so as to form a mass, and rub it through a No. 6 tinned-iron sieve. Then dry it, and reduce it to a coarse, granular powder.

Keep the product in well-closed vessels.

A white, coarsely granular salt, without odor, and having a mildly acidulous, refreshing taste. Deliquescent on exposure to the air.

Soluble, with copious effervescence, in 2 parts of water at 15° C. (59° F.), and very soluble in boiling water; almost insoluble in alcohol.

The aqueous solution (1 in 20) has an acid reaction, and, after the addition of ammonium chloride T.S. and a slight excess of ammonia water, it yields, with sodium phosphate T.S., a white, crystalline precipitate.

If to another portion of the aqueous solution a little calcium chloride T.S. be added, and then a slight excess of ammonia water, the filtered liquid will deposit a white precipitate on boiling.

A saturated, aqueous solution of the salt, when mixed with potassium acetate T.S. and a small quantity of acetic acid, should not yield a white, crystalline precipitate (absence of *tartrate*).

MAGNESII SULPHAS.

MAGNESIUM SULPHATE.



[EPSOM SALT.]

Magnesium Sulphate should be kept in well-closed vessels.

Small, colorless, rhombic prisms, or acicular crystals, without odor, and having a cooling, saline, and bitter taste; slowly efflorescent in dry air.

Soluble in 1.5 parts of water at 15° C. (59° F.), and in 0.7 part of boiling water; insoluble in alcohol.

When heated to 52° C. (125.6° F.), the salt loses 1 molecule of water, and is converted into a white powder. At about 132° C. (269.6° F.) it still retains 1 molecule of water, and at a temperature of 200° to 238° C. (392° to 460.4° F.) it is rendered anhydrous.

The aqueous solution is neutral to litmus paper.

When mixed with ammonium chloride T.S. and ammonia water, it yields, with sodium phosphate T.S., a white, crystalline precipitate. With barium chloride T.S. it yields a white precipitate insoluble in nitric acid.

When a small portion of the salt is introduced, on a clean platinum wire, into a non-luminous flame, it should not impart to the latter a persistent yellow color (limit of *sodium*).

A 5-per-cent. aqueous solution of the salt should not be affected by hydrogen sulphide T.S. (absence of *metallic impurities*); nor produce more than a slight opalescence with silver nitrate T.S. (limit of *chloride*); nor should 20 Cc. of the same solution give any coloration or precipitate on the addition of 0.5 Cc. of potassium ferrocyanide T.S. (absence of *iron, zinc, or copper*).

If 1 Gm. of the powdered salt be shaken with 3 Cc. of stannous chloride T.S. (see List of Reagents, Bettendorff's Test for Arsenic), a small piece of pure tin-foil added, and the test-tube then set aside, no coloration should appear within one hour (limit of *arsenic*).

Preparation: Infusum Sennæ Compositum.

MANGANI DIOXIDUM.

MANGANESE DIOXIDE.

[MANGANI OXIDUM NIGRUM, PHARM. 1880. BLACK OXIDE OF MANGANESE.]

Native crude Manganese Dioxide, containing at least 66 per cent. of the pure Dioxide [$\text{MnO}_2 = 86.72$].

A heavy, grayish-black, more or less gritty powder, without odor or taste; permanent in the air.

Insoluble in water or alcohol. It is not affected by cold, concentrated sulphuric acid, but when heated with the latter it is converted into manganous sulphate, with the evolution of oxygen.

When heated with hydrochloric acid, it is converted into manganous chloride, with the development of chlorine. At a red heat the Dioxide gives off oxygen gas, and is converted into reddish-brown manganoso-manganic oxide [Mn_3O_4].

On intimately mixing 1 part of the Dioxide with 1 part of potassium hydrate and 1 part of potassium chlorate, introducing the mass into a crucible, moistening with water, drying, and igniting, a dark fused mass is obtained, which yields, with water, a green solution, changing to purplish-red on being boiled, or on the addition of diluted sulphuric acid.

If a portion of the Dioxide be strongly heated in a dry test-tube, no combustion should ensue, nor should any carbon dioxide be evolved (absence of *organic impurities*).

If to another portion of the Dioxide, contained in a test-tube, a small quantity of diluted hydrochloric acid be added, no odor of hydrogen sulphide should be developed, nor should a strip of paper moistened with lead acetate T.S., and suspended over the mixture, become blackened (absence of *metallic sulphides*).

After the mixture of the Dioxide with hydrochloric acid has been raised to boiling and filtered, the filtered liquid should not give, with hydrogen sulphide T.S., an orange-colored precipitate (absence of *antimony sulphide*).

If 1 Gm. of the finely powdered Dioxide, contained in a small, long-necked flask, be mixed with 5 Cc. of water, then 4.22 Gm. of ferrous sulphate, in clear crystals, added, and subsequently 5 Cc. of hydrochloric acid, the mixture digested for about fifteen minutes at a gentle heat, and finally heated to boiling, the cooled filtrate, when immediately tested with freshly prepared potassium ferriocyanide T.S., should not acquire a blue color (presence of at least 66 per cent. of pure *Manganese Dioxide*).

MANGANI SULPHAS.

MANGANESE SULPHATE.



[MANGANOUS SULPHATE.]

Manganese Sulphate should be kept in well-stoppered bottles.

Colorless, or pale rose-colored, transparent, tetragonal prisms (crystallized at a temperature between 20° and 30° C. (68°–86° F.), and containing 4 molecules, or 32.29 per cent., of water of crystallization), odorless, and having a slightly bitter and astringent taste. Slightly efflorescent in dry air.

Soluble in 0.8 part of water at 15° C. (59° F.), and in 1 part of boiling water; insoluble in alcohol.

The aqueous solution is neutral or very slightly acid to litmus paper, and yields, with ammonium sulphide T.S., a flesh-colored precipitate soluble in dilute acids; with potassium ferrocyanide T.S., a reddish-white precipitate; and with potassium ferricyanide T.S., a brown precipitate.

With barium chloride T.S. it yields a white precipitate insoluble in hydrochloric acid.

If a fragment of the salt be mixed with a little sodium hydrate T.S., and the mixture then dried and fused, it will yield a dark green mass, dissolving in water with a green color.

A 5-per-cent. aqueous solution of the salt, after being heated with a few drops of hydrochloric acid and a little chlorine water, should not be colored red by potassium sulphocyanate T.S. (absence of *iron*), and should not be affected by hydrogen sulphide T.S. (absence of *copper* or *arsenic*).

If the manganese be completely precipitated from an aqueous solution of the salt by ammonium carbonate T.S., the filtrate, on evaporation and gentle ignition, should leave no residue (absence of *salts of the alkalies*, or of *magnesium*).

A solution of 1 Gm., each, of the salt, and of sodium acetate, in 10 Cc. of water, to which a few drops of acetic acid are added, should not be affected by hydrogen sulphide T.S. (absence of *zinc*).

If 1 Gm. of the salt be gently ignited, in a porcelain crucible, it should lose not more than 0.323 Gm. in weight (distinction from *Manganese Sulphate containing a larger amount of water of crystallization*).

MANNA.

MANNA.

The concrete, saccharine exudation of *Fraxinus Ornus* Linné (nat. ord. *Oleaceæ*).

In flattish, somewhat three-edged pieces, occasionally 20 Cm. long, and 5 Cm. broad, usually smaller; friable; externally yellowish-white, internally white, porous, and crystalline; or in fragments of different sizes, brownish-white and somewhat glutinous on the surface, internally white and crystalline; odor honey-like; taste sweet, slightly bitter and faintly acrid.

On heating 5 parts of Manna with 100 parts of alcohol to boiling, and filtering, the filtrate should rapidly deposit separate crystals of mannite.

Manna consisting of brownish, viscid masses containing few or no fragments of a crystalline structure should be rejected.

Preparation: Infusum Sennæ Compositum.

MARRUBIUM.

MARRUBIUM.

[HOREHOUND.]

The leaves and tops of *Marrubium vulgare* Linné (nat. ord. *Labiatae*).

Leaves about 25 Mm. long, opposite, petiolate, roundish-ovate, obtuse, coarsely crenate, strongly rugose, downy above, white-hairy beneath; branches quadrangular, white, tomentose; flowers in dense, axillary, woolly whorls, with a stiffly ten-toothed calyx, a whitish, bilabiate corolla, and four included stamens; aromatic and bitter.

MASSA COPAIBÆ.

MASS OF COPAIBA.

[SOLIDIFIED COPAIBA.]

Copaiba, <i>ninety-four grammes</i>	94 Gm.
Magnesia, <i>six grammes</i>	6 Gm.
Water, <i>a sufficient quantity</i> .	

Triturate the Magnesia with a little Water, in a capsule, until the powder is uniformly dampened throughout. Then gradually incorporate with it the Copaiba, so that a uniform mixture may result, place the capsule on a water-bath, and heat during half an hour, frequently stirring. Lastly, transfer the mixture to a suitable vessel, and set this aside until the mass has acquired a pilular consistence.

MASSA FERRI CARBONATIS.

MASS OF FERROUS CARBONATE.

[VALLET'S MASS.]

Ferrous Sulphate, in clear crystals, <i>one hundred grammes</i>	100 Gm.
Sodium Carbonate, <i>one hundred grammes</i>	100 Gm.
Clarified Honey, <i>thirty-eight grammes</i>	38 Gm.
Sugar, in coarse powder, <i>twenty-five grammes</i>	25 Gm.
Syrup,	
Distilled Water, each, <i>a sufficient quantity</i> ,	

To make *one hundred grammes*.... 100 Gm.

Dissolve the Ferrous Sulphate and the Sodium Carbonate, each separately, in *two hundred* (200) *cubic centimeters* of boiling Distilled Water, and, having added *twenty* (20) *cubic centimeters* of Syrup to the solution of the Iron salt, filter both solutions, and allow them to become cold. Introduce the solution of Sodium Carbonate into a bottle having a capacity of about *five hundred* (500) *cubic centimeters*, and gradually add the solution of the Iron salt, rotating the flask constantly or frequently, until carbonic acid gas no longer escapes. Add a sufficient quantity of Distilled Water to fill the bottle; then cork the bottle and set it aside, so that the ferrous carbonate may subside. Pour off the supernatant liquid, and, having mixed Syrup and Distilled Water in the proportion of *one* (1) *volume* of Syrup to *nineteen* (19) *volumes* of Distilled Water, wash the precipitate with the mixture by decantation until the washings no longer have a saline taste. Drain the precipitate on a muslin strainer, and express as much of the Water as possible. Lastly, mix the precipitate at once with the Honey and Sugar, and, by means of a water-bath, evaporate the mixture in a tared capsule, with constant stirring, until it is reduced to *one hundred* (100) *grammes*.

MASSA HYDRARGYRI.

MASS OF MERCURY.

[PILULA HYDRARGYRI. BLUE MASS. BLUE PILL.]

Mercury, <i>thirty-three grammes</i>	33 Gm.
Glycyrrhiza, in No. 60 powder, <i>five grammes</i>	5 Gm.
Althæa, in No. 60 powder, <i>twenty-five grammes</i>	25 Gm.
Glycerin, <i>three grammes</i>	3 Gm.
Honey of Rose, <i>thirty-four grammes</i>	34 Gm.

To make *one hundred grammes*.... 100 Gm.

Triturate the Mercury with the Honey of Rose and Glycerin until it is extinguished. Then gradually add the Glycyrrhiza and Althæa, and continue the trituration until globules of mercury are no longer visible under a lens magnifying at least ten diameters.

If a portion of the Mass be triturated, in a mortar, with warm acetic acid, the filtrate should not become more than slightly opalescent on the addition of a few drops of hydrochloric acid (limit of *mercurous oxide*).

If another portion of the Mass be digested with warm, diluted hydrochloric acid and a little purified animal charcoal, the filtrate should not be affected by hydrogen sulphide T.S., or by stannous chloride T.S. (absence of *mercuric oxide*).

MASTICHE.**MASTIC.**

• A concrete resinous exudation from *Pistacia Lentiscus* Linné (nat. ord. *Anacardiæ*).

Globular or elongated tears, of about the size of a pea, sometimes covered with a whitish dust, pale yellow, transparent, having a glass-like lustre and an opalescent refraction; brittle; becoming plastic when chewed; of a weak, somewhat balsamic, resinous odor, and a mild, terebinthinate taste.

Mastic is completely soluble in ether, and, for the most part, soluble in alcohol.

Preparation: *Pilulæ Aloes et Mastiches*.

MATICO.**MATICO.**

The leaves of *Piper angustifolium* Ruiz et Pavon (nat. ord. *Piperaceæ*).

From 10 to 15 Cm. long, short-petiolate, oblong-lanceolate, apex pointed, base unequally heart-shaped, margin very finely crenulate, tessellated above, reticulate beneath, the meshes small, and the veins densely brownish-hairy; aromatic, spicy, and bitterish.

Preparations: *Extractum Matico Fluidum*. *Tinctura Matico*.

MATRICARIA.**MATRICARIA.**

[GERMAN CHAMOMILE.]

The flower-heads of *Matricaria Chamomilla* Linné (nat. ord. *Compositæ*).

About 15 to 20 Mm. broad, composed of a flattish, imbricate involucre, a conical, hollow, naked receptacle, which is about 5 Mm. high, about fifteen white, ligulate, reflexed ray-florets, and numerous yellow, tubular, perfect disk-florets without pappus; strongly aromatic and bitter.

The similar flower-heads of *Anthemis arvensis* Linné, and *Maruta Cotula* De Candolle (nat. ord. *Compositæ*), have conical, solid, and chaffy receptacles.

MEL.**HONEY.**

A saccharine secretion deposited in the honey-comb by *Apis mellifica* Linné (class *Insecta*; order *Hymenoptera*).

A syrupy liquid of a light yellowish to pale yellowish-brown color, translucent when fresh, but gradually becoming opaque and crystalline, having a characteristic, aromatic odor, and a sweet, faintly acrid taste.

When recent Honey is diluted with 2 parts of water, the resulting liquid should be almost clear, not stringy, and should have a specific gravity not lower than 1.100 (corresponding to a specific gravity of 1.375 for the original Honey).

Honey has a faintly acid reaction towards litmus paper.

If 1 part of Honey be dissolved in 4 parts of water, a clear or nearly clear solution will result, which should not be rendered more than faintly opalescent by a few drops of silver nitrate T.S. (limit of *chlorides*), or of barium chloride T.S. (limit of *sulphates*).

If 1 volume of Honey be diluted with 1 volume of water, and a portion of this liquid gradually mixed with 5 volumes of absolute alcohol, it should not become more than faintly opalescent (as compared with the reserved portion of the solution), and should neither become opaque, nor deposit a slimy substance on the inner walls and bottom of the test-tube. And when Honey is incinerated, in small portions at a time, in a platinum crucible, it should not leave more than 0.2 per cent. of ash (absence of *glucose* and *foreign inorganic substances*).

On boiling 1 part of Honey with 5 parts of water, the resulting solution, when cold, should not be rendered blue or green on the addition of iodine T.S. (absence of *starch*).

Preparation: Mel Despumatum.

MEL DESPUMATUM.

CLARIFIED HONEY.

Honey, *a convenient quantity*.

Glycerin, *a sufficient quantity*.

Mix the Honey intimately with *two (2) per cent.* of its weight of paper-pulp, which has been previously reduced to shreds, thoroughly washed and soaked in water, and then strongly expressed and again shredded. Then apply the heat of a water-bath, and, as long as any scum rises to the surface, carefully remove this. Finally, add enough Distilled Water to make up the loss incurred by evaporation, strain, and mix the strained liquid with *five (5) per cent.* of its weight of glycerin.

Clarified Honey should conform to the tests of purity given under Honey (see *Mel*).

MEL ROSÆ.

HONEY OF ROSE.

Fluid Extract of Rose, *one hundred and twenty cubic centimeters* 120 Cc.

Clarified Honey, *a sufficient quantity*,

To make *one thousand grammes*. . . . 1000 Gm.

Into a tared vessel introduce the Fluid Extract of Rose, then add enough Clarified Honey to make the contents weigh *one thousand (1000) grammes*, and mix them thoroughly.

MELISSA.**MELISSA.**

[BALM.]

The leaves and tops of *Melissa officinalis* Linné (nat. ord. *Labiatae*).

Leaves about 5 Cm. long, petiolate, ovate, obtuse, rounded or subcordate at the base, crenate, somewhat hairy, glandular; branches quadrangular; flowers in about four-flowered cymes, with a tubular, bell-shaped, five-toothed calyx, a whitish or purplish bilabiate corolla, and four stamens; fragrant, aromatic; somewhat astringent and bitterish.

MENISPERMUM.**MENISPERMUM.**

[YELLOW PARILLA. CANADIAN MOONSEED.]

The rhizome and roots of *Menispermum canadense* Linné (nat. ord. *Menispermaceae*).

Rhizome several feet long, about 5 Mm. thick, brown or yellowish-brown, somewhat knotty, finely wrinkled longitudinally and beset with numerous thin, rather brittle roots; fracture tough, woody; internally yellowish, the bark rather thick, the wood-rays broad, porous, and longest on the lower side; pith distinct. Nearly inodorous; taste bitter.

Preparation: Extractum Menispermum Fluidum.

MENTHA PIPERITA.**PEPPERMINT.**

The leaves and tops of *Mentha piperita* Smith (nat. ord. *Labiatae*).

Leaves about 5 Cm. long, petiolate, ovate-lanceolate, acute, sharply serrate, glandular, nearly smooth, the few hairs containing crystals of menthol in one or more thin cells; branches quadrangular, often purplish; flowers in terminal, conical spikes, with a tubular, five-toothed, often purplish calyx, a purplish four-lobed corolla, and four short stamens; odor aromatic; taste pungent and cooling.

Preparation: Spiritus Menthae Piperitæ.

MENTHA VIRIDIS.**SPEARMINT.**

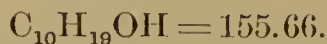
The leaves and tops of *Mentha viridis* Linné (nat. ord. *Labiatae*).

Leaves about 5 Cm. long, subsessile, lance-ovate, acute, serrate, glandular, nearly smooth; branches quadrangular, mostly light green; flowers in terminal, interrupted, narrow, acute spikes, with a tubular, sharply five-toothed calyx, a light purplish, four-lobed corolla, and four rather long stamens; odor aromatic; taste pungent.

Preparation: Spiritus Menthae Viridis.

MENTHOL.

MENTHOL.



A stearopten (having the character of a secondary alcohol), obtained from the official oil of peppermint (from *Mentha piperita* Smith), or from Japanese or Chinese oil of peppermint (from *Mentha arvensis* Linné, var. *piperascens* Holmes, and *Mentha canadensis* Linné, var. *glabrata* Holmes; nat. ord. *Labiata*).

Menthol should be kept in well-stoppered bottles, in a cool place.

Colorless, acicular or prismatic crystals, having a strong and pure odor of peppermint, and a warm, aromatic taste, followed by a sensation of cold, when air is drawn into the mouth.

Menthol is only slightly soluble in water, but imparts to the latter its odor and taste. It is freely soluble in alcohol, ether, chloroform, carbon disulphide, or glacial acetic acid.

It melts at 43° C. (109.4° F.) to a colorless liquid, boils at 212° C. (413.6° F.), and volatilizes slowly at the ordinary temperature.

When it is triturated with about an equal weight of camphor, thymol, or chloral hydrate, the mixture becomes liquid.

Its alcoholic solution is neutral to litmus paper, and deviates polarized light to the left.

If a little Menthol be heated in an open capsule, on a water-bath, it should gradually volatilize without leaving any residue (absence of *wax*, *paraffin*, or *inorganic substances*).

If a few crystals of Menthol be dissolved in 1 Cc. of glacial acetic acid, and then 3 drops of sulphuric acid and 1 drop of nitric acid added, no green color should be produced (absence of *thymol*).

METHYL SALICYLAS.

METHYL SALICYLATE.



[ARTIFICIAL (OR SYNTHETIC) OIL OF WINTERGREEN.]

Methyl Salicylate, produced synthetically.

It should be kept in well-stoppered bottles, protected from light.

A colorless or slightly yellowish liquid, having the characteristic, strongly aromatic odor and the sweetish, warm, and aromatic taste of Oil of Gaultheria, with the essential constituent of which it is identical. It is wholly identical with Volatile Oil of Betula (see *Oleum Betulæ Volatile*).

Specific gravity: 1.183–1.185 at 15° C. (59° F.). Boiling point: 219°–221° C. (426.2°–429.8° F.). It is optically inactive.

Soluble, in all proportions, in alcohol, glacial acetic acid, or carbon disulphide.

The alcoholic solution is neutral or slightly acid to litmus paper.

If a drop of Methyl Salicylate be shaken with a little water, and a drop of ferric chloride T.S. subsequently added, a deep violet color will be produced.

When heated on a water-bath, in a flask provided with a suitable condenser, it should yield no distillate having the characteristics of *alcohol* or *chloroform*.

If to 1 Cc. of Methyl Salicylate, contained in a capacious test-tube, 10 Cc. of sodium hydrate T.S. be added, and the mixture agitated, a bulky, white, crystalline precipitate will be produced; then, if the test-tube, loosely corked, be allowed to stand in boiling water for about five minutes, with occasional

agitation, the precipitate should dissolve, and form a clear, colorless or faintly yellowish solution, without the separation of any oily drops, either on the surface or at the bottom of the liquid (absence of *other volatile oils*, or of *petroleum*).

If the alkaline liquid thus obtained be subsequently diluted with about three times its volume of water, and a slight excess of hydrochloric acid added, a white, crystalline precipitate will be produced which, when collected on a filter, washed with a little water, and recrystallized from hot water, should respond to the tests of identity and purity described under *Acidum Salicylicum* (absence of *methyl benzoate*, etc.).

MEZEREUM.

MEZEREUM.

The bark of *Daphne Mezereum* Linné, and of other species of *Daphne* (nat. ord. *Thymelæaceæ*).

In long, thin bands, usually folded or rolled into disks; outer surface yellowish or brownish-yellow, with transverse scars, and minute, blackish dots, underneath of a light greenish color; inner surface whitish, silky; bast in transverse layers, very tough; inodorous; taste very acid.

Preparations: Decoctum Sarsaparillæ Compositum. Extractum Sarsaparillæ Fluidum Compositum. Extractum Mezerei Fluidum.

MISTURA CRETÆ.

CHALK MIXTURE.

Compound Chalk Powder, <i>two hundred grammes</i>	200 Gm.
Cinnamon Water, <i>four hundred cubic centimeters</i>	400 Cc.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

Rub the Compound Chalk Powder, in a mortar, with the Cinnamon Water and about *two hundred* (200) *cubic centimeters* of Water gradually added, to a uniform mixture; transfer this to a graduated vessel, and rinse the mortar with enough Water to make the product measure *one thousand* (1000) *cubic centimeters*. Mix the whole thoroughly.

This preparation should be freshly made, when wanted.

MISTURA FERRI COMPOSITA.

COMPOUND IRON MIXTURE.

[GRIFFITH'S MIXTURE.]

Ferrous Sulphate, in clear crystals, <i>six grammes</i>	6 Gm.
Myrrh, in small pieces, <i>eighteen grammes</i>	18 Gm.
Sugar, <i>eighteen grammes</i>	18 Gm.
Potassium Carbonate, <i>eight grammes</i>	8 Gm.
Spirit of Lavender, <i>sixty cubic centimeters</i>	60 Cc.
Rose Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

Rub the Myrrh, Sugar, and Potassium Carbonate, in a mortar, with *seven hundred (700) cubic centimeters* of Rose Water, at first very gradually added, so that a uniform mixture may result. Transfer this to a graduated vessel, add the Spirit of Lavender, then the Ferrous Sulphate, previously dissolved in about *fifty (50) cubic centimeters* of Rose Water, and, lastly, enough Rose Water to make the product measure *one thousand (1000) cubic centimeters*. Mix the whole thoroughly.

This preparation should be freshly made, when wanted.

MISTURA GLYCYRRHIZÆ COMPOSITA.

COMPOUND MIXTURE OF GLYCYRRHIZA.

[BROWN MIXTURE.]

Pure Extract of Glycyrrhiza, <i>thirty grammes</i>	30 Gm.
Syrup, <i>fifty cubic centimeters</i>	50 Cc.
Mucilage of Acacia, <i>one hundred cubic centimeters</i>	100 Cc.
Camphorated Tincture of Opium, <i>one hundred and twenty cubic centimeters</i>	120 Cc.
Wine of Antimony, <i>sixty cubic centimeters</i>	60 Cc.
Spirit of Nitrous Ether, <i>thirty cubic centimeters</i>	30 Cc.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Rub the Pure Extract of Glycyrrhiza, in a mortar, with *five hundred (500) cubic centimeters* of Water, until it is dissolved. Transfer the solution to a graduated vessel containing the other ingredients, and rinse the mortar with enough Water to make the product measure *one thousand (1000) cubic centimeters*. Mix the whole thoroughly.

MISTURA RHEI ET SODÆ.

MIXTURE OF RHUBARB AND SODA.

Sodium Bicarbonate, <i>thirty-five grammes</i>	35 Gm.
Fluid Extract of Rhubarb, <i>fifteen cubic centimeters</i>	15 Cc.
Fluid Extract of Ipecac, <i>three cubic centimeters</i>	3 Cc.
Glycerin, <i>three hundred and fifty cubic centimeters</i>	350 Cc.
Spirit of Peppermint, <i>thirty-five cubic centimeters</i>	35 Cc.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Dissolve the Sodium Bicarbonate in about *four hundred (400) cubic centimeters* of Water. Then add the Fluid Extracts, the Glycerin, and the Spirit of Peppermint, and, lastly, enough Water to make *one thousand (1000) cubic centimeters*.

MORPHINA.

MORPHINE.



An alkaloid obtained from Opium.

Colorless or white, shining, prismatic crystals, or fine needles, or a crystalline powder, odorless, and having a bitter taste; permanent in the air.

Soluble, at 15° C. (59° F.), in 4350 parts of water, and in 300 parts of alcohol; in 455 parts of boiling water, and in 36 parts of boiling alcohol; also soluble in 4000 parts of ether.

When heated to about 75° C. (167° F.), Morphine begins to lose its water of crystallization. Heated for some time at 100° C. (212° F.), it becomes anhydrous. At 254° C. (489.2° F.) it melts, forming a black liquid. Upon ignition, it is consumed without leaving a residue.

Morphine has an alkaline reaction upon litmus paper.

When crystals of Morphine are sprinkled upon nitric acid (specific gravity 1.250 to 1.300), they will assume an orange-red color, and then produce a reddish solution gradually changing to yellow.

On shaking a small portion of Morphine, in a test-tube, with 10 Cc. of chlorine water, the latter will acquire a yellowish color. On now carefully pouring a small amount of ammonia water on the surface of the liquid, a brown or reddish-brown zone will form at the line of contact of the two liquids.

If to a neutral 1-per-cent. solution of Morphine, made by the careful addition of dilute sulphuric acid, a few drops of ferric chloride T.S. be added, a blue color will be produced which is destroyed by acids, alcohol, or heating.

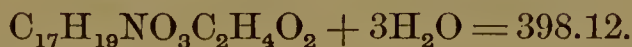
On treating Morphine with cold, concentrated sulphuric acid free from nitric acid, the liquid should not at once acquire more than a faintly yellowish tinge (absence of more than traces of *narcotine*, *papaverine*, etc.); and the subsequent addition of a small crystal of potassium permanganate should produce only a greenish, but no violet or purple, color (difference from *strychnine*).

On precipitating a solution of any of the salts of Morphine by ammonia water, dissolving the washed precipitate in sodium hydrate T.S., shaking the solution with an equal volume of ether, and evaporating the ethereal solution, no appreciable residue should remain (absence of *narcotine*, *codeine*, etc.).

On adding 4 Cc. of potassium or sodium hydrate T.S. to 0.2 Gm. of Morphine, a clear, colorless solution, free from any undissolved residue, should result (absence of, and difference from, *various other alkaloids*).

MORPHINÆ ACETAS.

MORPHINE ACETATE.



Morphine Acetate should be kept in dark amber-colored, well-stoppered vials.

A white or faintly yellowish-white, crystalline or amorphous powder, having a faint, acetous odor, and a bitter taste. It slowly loses acetic acid when exposed to the air.

Soluble, at 15° C. (59° F.), when freshly prepared, in 2.5 parts of water, and in 47.6 parts of alcohol; in 1.5 parts of boiling water, and in 14 parts of boiling alcohol; also soluble in about 1700 parts of ether, 2100 parts of cold chloroform, and 60 parts of boiling chloroform. On protracted exposure to the air the salt gradually loses some acetic acid, and becomes less soluble.

When heated, the salt loses water as well as acetic acid. Upon ignition, it is consumed, leaving no residue.

The salt is neutral or faintly alkaline to litmus paper.

The addition of potassium or sodium hydrate T.S. to an aqueous solution of the salt causes a white precipitate, which is soluble in an excess of the alkali, and which conforms to the reactions and tests of Morphine (see *Morphina*).

On adding sulphuric acid to the salt, vapors of acetic acid are evolved.

MORPHINÆ HYDROCHLORAS.

MORPHINE HYDROCHLORATE.



White, feathery needles of a silky lustre, or minute, colorless, needle-shaped crystals, odorless, and having a bitter taste; permanent in the air.

Soluble, at 15° C. (59° F.), in 24 parts of water, and in 62 parts of alcohol; in 0.5 part of boiling water, and in 31 parts of boiling alcohol. Very slightly soluble in ether or chloroform.

When heated at 100° C. (212° F.), the salt loses its water of crystallization (14.38 per cent.); at 300° C. (572° F.) it coheres slightly, but does not completely melt; and upon ignition it is consumed, leaving no residue.

The salt is neutral to litmus paper.

The addition of potassium or sodium hydrate T.S. to an aqueous solution of the salt causes a white precipitate, soluble in an excess of the alkali, and conforming to the reactions and tests of Morphine (see *Morphina*).

The aqueous solution of the salt yields, with silver nitrate T.S., a white precipitate insoluble in nitric acid.

MORPHINÆ SULPHAS.

MORPHINE SULPHATE.



White, feathery, acicular crystals of a silky lustre, odorless, and having a bitter taste; permanent in the air.

Soluble, at 15° C. (59° F.), in 21 parts of water, and in 702 parts of alcohol; in 0.75 part of boiling water, and in 144 parts of boiling alcohol; almost insoluble in ether.

When heated for some time at 100° C. (212° F.), the salt loses 3 molecules (7.12 per cent.) of water of crystallization; the remaining 2 molecules (4.75 per cent.) are gradually expelled by raising the temperature to 130° C. (266° F.). At 255° C. (491° F.) the salt melts, and, upon ignition, it is consumed, leaving no residue.

The salt is neutral to litmus paper.

The addition of potassium or sodium hydrate T.S. to an aqueous solution of the salt causes a white precipitate, which is soluble in an excess of the alkali, and which conforms to the reactions and tests of Morphine (see *Morphina*).

The aqueous solution yields, with barium chloride T.S., a white precipitate insoluble in hydrochloric acid.

Preparations: Pulvis Morphinae Compositus. Trochisci Morphinae et Ipecacuanhae.

MOSCHUS.

MUSK.

The dried secretion from the preputial follicles of *Moschus moschiferus* Linné (class *Mammalia*; order *Ruminantia*).

In irregular, crumbly, somewhat unctuous grains, dark reddish-brown, having a peculiar, penetrating and persistent odor, and a bitterish taste. It is contained in oval or roundish sacs about 4 to 5 Cm. in diameter, on one side invested with a smoothish membrane, on the other side covered with stiff, appressed, grayish hairs, concentrically arranged around two orifices near the center.

About 10 per cent. of Musk is soluble in alcohol, the tincture being light brownish-yellow, and on the addition of water becoming slightly turbid. About 50 per cent. of Musk is soluble in water, the solution being deep brown, faintly acid, and strongly odorous.

When ignited with free access of air, Musk gives off a peculiar, somewhat urinous odor, and leaves behind not more than 8 per cent. of a grayish ash.

Preparation: Tinctura Moschi.

MUCILAGO ACACIÆ.

MUCILAGE OF ACACIA.

Acacia, in small fragments, *three hundred and forty grammes* 340 Gm.
Water, *a sufficient quantity*,

To make *one thousand grammes*. . . . 1000 Gm.

Wash the Acacia with cold Water, and let it drain. Then add to it enough Water to make the mixture weigh *one thousand* (1000) *grammes*, agitate or stir occasionally until the Acacia is dissolved, and strain. Keep the product in well-stoppered, completely filled bottles, in a cool place.

Preparation: Syrupus Acaciæ.

MUCILAGO SASSAFRAS MEDULLÆ.

MUCILAGE OF SASSAFRAS PITH.

Sassafras Pith, *two grammes* 2 Gm.
Water, *one hundred cubic centimeters* 100 Cc.

Macerate the Sassafras Pith in the Water during three hours, and strain.

This preparation should be freshly made, when wanted.

MUCILAGO TRAGACANTHÆ.

MUCILAGE OF TRAGACANTH.

Tragacanth, *six grammes* 6 Gm.
Glycerin, *eighteen grammes* 18 Gm.
Water, *a sufficient quantity*,

To make *one hundred grammes*. . . . 100 Gm.

Mix the Glycerin with *seventy-five (75) cubic centimeters* of Water in a tared vessel, heat the mixture to boiling, add the Tragacanth, and let it macerate during twenty-four hours, stirring occasionally. Then add enough Water to make the mixture weigh *one hundred (100) grammes*, beat it so as to make it of uniform consistence, and strain it forcibly through muslin.

MUCILAGO ULMI.

MUCILAGE OF ELM.

Elm, bruised, *six grammes*..... 6 Gm.
Water, *one hundred cubic centimeters* 100 Cc.

Digest the Elm with the Water, on a water-bath, in a covered vessel, during one hour, then strain.

This preparation should be freshly made, when wanted.

MYRISTICA.

NUTMEG.

The seed of *Myristica fragrans* Houttuyn (nat. ord. *Myristicaceæ*), deprived of its testa.

Oval or roundish-ovate, about 25 Mm. long, light brown, reticulately furrowed, with a circular scar on the broad end; internally pale brownish, with dark orange-brown veins, and of a fatty lustre; odor strongly aromatic; taste aromatic, warm, and somewhat bitter.

Preparations: Pulvis Aromaticus. Tinctura Lavandulæ Composita.

MYRRHA.

MYRRH.

A gum-resin obtained from *Commiphora Myrrha* (Nees) Engler (nat. ord. *Burseraceæ*).

In roundish or irregular tears or masses, dusty, brownish-yellow or reddish-brown; fracture waxy, somewhat splintery, translucent on the edges, sometimes marked with whitish veins; odor balsamic; taste aromatic, bitter and acrid.

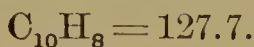
When triturated with water, Myrrh yields a brownish-yellow emulsion; with alcohol it yields a brownish-yellow tincture which acquires a purple tint on the addition of nitric acid.

Dark-colored pieces, the alcoholic solution of which is not rendered purple by nitric acid, and pieces of gum which dissolve completely, as well as those which merely swell in water, should be rejected.

Preparations: Mistura Ferri Composita. Pilulæ Aloes et Myrrhæ. Tinctura Aloes et Myrrhæ. Tinctura Myrrhæ.

NAPHTALINUM.

NAPHTALIN.



[NAPHTALENE.]

A hydrocarbon obtained from coal-tar. It should be kept in well-stoppered bottles.

Colorless, shining, transparent laminæ, having a strong, characteristic odor resembling that of coal-tar, and a burning aromatic taste; slowly volatilized on exposure to air.

Insoluble in water, but when boiled with the latter imparting to it a faint odor and taste. Soluble in 15 parts of alcohol at 15° C. (59° F.), and very soluble in boiling alcohol; also very soluble in ether, chloroform, carbon disulphide, and fixed or volatile oils.

Naphtalin volatilizes slowly at ordinary temperatures; rapidly when heated. It also volatilizes with the vapors of water or alcohol. At 80° C. (176° F.) it melts, and at 218° C. (424.4° F.) it boils. Its vapor is inflammable, burning with a luminous and smoky flame. When ignited, it is consumed, leaving no residue.

Naphtalin is neutral to litmus paper moistened with alcohol.

On shaking a small portion of Naphtalin with concentrated sulphuric acid, the acid should remain colorless; nor should it acquire more than a pale reddish tint if the mixture be heated for five minutes on a water-bath (absence of contaminations derived from coal-tar).

NAPHTOL.

NAPHTOL.



[BETA-NAPHTOL.]

A phenol occurring in coal-tar, but usually prepared artificially from naphtalin.

Naphtol should be kept in dark amber-colored, well-stoppered bottles.

Colorless, or pale buff-colored, shining, crystalline laminæ, or a white, or yellowish-white, crystalline powder, having a faint, phenol-like odor, and a sharp and pungent but not persistent taste. Permanent in the air.

Soluble, at 15° C. (59° F.), in about 1000 parts of water, and in 0.75 part of alcohol; in about 75 parts of boiling water, and very soluble in boiling alcohol. Also very soluble in ether, chloroform, or solutions of caustic alkalies.

When heated, Naphtol sublimes easily. It is also volatilized with the vapors of alcohol or water. It melts at 122° C. (251.6° F.), and boils at 286° C. (546.8° F.). On ignition, it is consumed, leaving no residue.

It is neutral to litmus paper moistened with alcohol.

A cold, saturated, aqueous solution of Naphtol, when mixed with ammonia water, exhibits a faint bluish fluorescence.

Chlorine or bromine water, added to the aqueous solution, produces a white turbidity, which disappears on adding ammonia water in excess.

On adding about 0.1 Gm. of Naphtol to about 5 Cc. of an aqueous solution (1 in 4) of potassium hydrate, then about 1 Cc. of chloroform, and gently warming, the aqueous layer will acquire a blue tint, changing after a while to green and brown.

Ferric chloride T.S. colors the aqueous solution of Naphtol greenish, and, after some time, causes the separation of white flakes, which turn brown upon the application of heat.

A piece of pine wood dipped into an aqueous solution of Naphtol, and afterwards moistened with diluted hydrochloric acid, becomes green on exposure to daylight.

Naphtol should dissolve in 50 parts of ammonia water without leaving a residue (absence of *naphthalin*), and the solution should not have a deeper tint than pale yellow (absence of *various other organic impurities*).

If 0.1 Gm. of Naphtol be mixed, in a test-tube, with 1 drop of syrup and 5 Cc. of water, and about 3 Cc. of concentrated sulphuric acid be then poured into the tube held in a slanting position, so that the liquids may form separate layers, a yellowish-brown color will appear at the zone of contact, which becomes darker on standing (absence of, and distinction from, *alpha-naphtol*, which produces at once a crimson color, turning deep blue in the upper part of the zone on standing).

NUX VOMICA.

NUX VOMICA.

The seed of *Strychnos Nux-vomica* Linné (nat. ord. *Loganiaceæ*).

About 25 Mm. in diameter, orbicular, grayish or greenish-gray; soft-hairy, of a silky lustre, with a slight ridge extending from the center of one side to the edge; internally horny, somewhat translucent, very tough, with a large, circular cavity, into which the heart-shaped, nerved cotyledons project. It is inodorous and persistently bitter.

Preparations: Extractum Nucis Vomicae. Extractum Nucis Vomicae Fluidum.

OLEATUM HYDRARGYRI.

OLEATE OF MERCURY.

Yellow Mercuric Oxide, thoroughly dried, *two hundred*

grammes 200 Gm.

Oleic Acid, *eight hundred grammes* 800 Gm.

To make *one thousand grammes*.... 1000 Gm.

Introduce the Oleic Acid into a capacious mortar, and gradually add to it the Yellow Mercuric Oxide by sifting it upon the surface of the Acid, and incorporate it by continuous stirring. Then set the mixture aside in a warm place, at a temperature not exceeding 40° C. (104° F.), and stir frequently, until the Oxide is dissolved.

OLEATUM VERATRINÆ.

OLEATE OF VERATRINE.

Veratrine, *two grammes* 2 Gm.

Oleic Acid, *ninety-eight grammes* 98 Gm.

To make *one hundred grammes*.... 100 Gm.

Rub the Veratrine with a small quantity of Oleic Acid, in a warm mortar, to a smooth paste. Then add the remainder of the Oleic Acid, previously warmed, and stir frequently, until the Veratrine is dissolved.

OLEATUM ZINCI.

OLEATE OF ZINC.

Zinc Oxide, <i>fifty grammes</i>	50 Gm.
Oleic Acid, <i>nine hundred and fifty grammes</i>	950 Gm.
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To make <i>one thousand grammes</i>	1000 Gm.

Introduce the Oleic Acid into a capacious capsule, and gradually add to it the Zinc Oxide by sifting it upon the surface of the Acid, and incorporate it by continuous stirring. Set the mixture aside for a few hours, and then heat it on a water-bath, frequently stirring, until the Oxide is dissolved.

OLEORESINA ASPIDII.

OLEORESIN OF ASPIDIUM.

Aspidium, recently reduced to No. 60 powder, <i>five hundred grammes</i>	500 Gm.
Ether, <i>a sufficient quantity</i> .	

Put the Aspidium into a cylindrical glass percolator, provided with a stop-cock, and arranged with cover and receptacle suitable for volatile liquids. Press the drug firmly, and percolate slowly with Ether, added in successive portions, until the drug is exhausted. Recover the greater part of the Ether from the percolate by distillation on a water-bath, and, having transferred the residue to a capsule, allow the remaining Ether to evaporate spontaneously.

Keep the Oleoresin in a well-stoppered bottle.

NOTE.—Oleoresin of Aspidium usually deposits, on standing, a granular-crystalline substance. This should be thoroughly mixed with the liquid portion before use.

OLEORESINA CAPSICI.

OLEORESIN OF CAPSICUM.

Capsicum, in No. 60 powder, <i>five hundred grammes</i>	500 Gm.
Ether, <i>a sufficient quantity</i> .	

Put the Capsicum into a cylindrical glass percolator, provided with a stop-cock, and arranged with cover and receptacle suitable for vola-

tile liquids. Press the drug firmly, and percolate slowly with Ether, added in successive portions, until the drug is exhausted. Recover the greater part of the Ether from the percolate by distillation on a water-bath, and, having transferred the residue to a capsule, allow the remaining Ether to evaporate spontaneously. Then pour off the liquid portion, transfer the remainder to a strainer, and, when the separated fatty matter (which is to be rejected) has been completely drained, mix the liquid portions together.

Keep the Oleoresin in a well-stoppered bottle.

Preparation: Emplastrum Capsici.

OLEORESINA CUBEBÆ.

OLEORESIN OF CUBEB.

Cubeb, in No. 30 powder, *five hundred grammes* 500 Gm.

Ether, *a sufficient quantity*.

Put the Cubeb into a cylindrical glass percolator, provided with a stop-cock, and arranged with cover and receptacle suitable for volatile liquids. Press the drug firmly, and percolate slowly with Ether, added in successive portions, until the drug is exhausted. Recover the greater part of the Ether from the percolate by distillation on a water-bath, and, having transferred the residue to a capsule, allow the remaining Ether to evaporate spontaneously.

Keep the product in a well-stoppered bottle.

NOTE.—Oleoresin of Cubeb deposits, after standing for some time, a waxy and crystalline matter, which should be rejected, only the liquid portion being used.

Preparation: Trochisci Cubebæ.

OLEORESINA LUPULINI.

OLEORESIN OF LUPULIN.

Lupulin, *one hundred grammes* 100 Gm.

Ether, *a sufficient quantity*.

Put the Lupulin into a cylindrical glass percolator, provided with a stop-cock, and arranged with cover and receptacle suitable for volatile liquids. Press the drug very lightly, and percolate slowly with Ether, added in successive portions, until the drug is exhausted. Recover the greater part of the Ether from the percolate by distillation on a water-bath, and, having transferred the residue to a capsule, allow the remaining Ether to evaporate spontaneously.

Keep the Oleoresin in a well-stoppered bottle.

OLEORESINA PIPERIS.**OLEORESIN OF PEPPER.**

Pepper, in No. 60 powder, *five hundred grammes* 500 Gm.
Ether, *a sufficient quantity*.

Put the Pepper into a cylindrical glass percolator, provided with a stop-cock, and arranged with a cover and receptacle for volatile liquids. Press the drug firmly, and percolate slowly with Ether, added in successive portions, until the drug is exhausted. Recover the greater part of the Ether from the percolate by distillation on a water-bath, and, having transferred the residue to a capsule, set this aside until the remaining Ether has evaporated, and the deposition of crystals of piperin has ceased. Lastly, separate the Oleoresin from the piperin by expression through a muslin strainer.

Keep the Oleoresin in a well-stoppered bottle.

OLEORESINA ZINGIBERIS.**OLEORESIN OF GINGER.**

Ginger, in No. 60 powder, *five hundred grammes* 500 Gm.
Ether, *a sufficient quantity*.

Put the Ginger into a cylindrical glass percolator, provided with a stop-cock, and arranged with cover and receptacle suitable for volatile liquids. Press the drug firmly, and percolate slowly with Ether, added in successive portions, until the drug is exhausted. Recover the greater part of the Ether from the percolate by distillation on a water-bath, and, having transferred the residue to a capsule, allow the remaining Ether to evaporate spontaneously.

Keep the Oleoresin in a well-stoppered bottle.

OLEUM ADIPIS.**LARD OIL.**

A fixed oil expressed from Lard at a low temperature.

A colorless or pale yellow, oily liquid, having a peculiar odor, and a bland taste.

Specific gravity : 0.910 to 0.920 at 15° C. (59° F.).

At a temperature a little below 10° C. (50° F.) it usually commences to deposit a white, granular fat, and at or near 0° C. (32° F.) it forms a semi-solid, white mass.

When it is brought in contact with concentrated sulphuric acid, a dark reddish-brown color is instantly produced.

If 5 Cc. of the oil be thoroughly shaken, in a test-tube, with 5 Cc. of an alcoholic solution of silver nitrate (made by dissolving 0.1 Gm. of silver nitrate

in 10 Cc. of deodorized alcohol, and adding 2 drops of nitric acid), and the mixture heated for about five minutes in a water-bath, the Oil should remain nearly or quite colorless, not acquiring a reddish or brown color, nor should any dark color be produced at the line of contact of the two liquids (absence of more than about 5 per cent. of *cotton seed oil*).

If 5 Cc. of the Oil, contained in a small flask, be mixed with a solution of 2 Gm. of potassium hydrate in 2 Cc. of water, then 5 Cc. of alcohol added, and the mixture heated for about five minutes on a water-bath, with occasional agitation, a perfectly clear and complete solution should be formed, which, on dilution with water to the volume of 50 Cc., should form a transparent, light yellow liquid, without the separation of an oily layer (absence of appreciable quantities of *paraffin oils*).

OLEUM ÆTHEREUM.

ETHEREAL OIL.

A volatile liquid consisting of equal volumes of Heavy Oil of Wine and Ether.

Alcohol, <i>one thousand cubic centimeters</i>	1000 Cc.
Sulphuric Acid, <i>one thousand cubic centimeters</i>	1000 Cc.
Distilled Water, <i>twenty-five cubic centimeters</i>	25 Cc.
Ether, <i>a sufficient quantity</i> .	

Add the Acid slowly to the Alcohol, mix them thoroughly, and allow the mixture to stand, in a closed flask, for twenty-four hours, or until the liquid is clear; then pour the clear liquid into a tubulated retort of such capacity that the mixture shall nearly fill it. Insert a thermometer through the tubulure, so that the bulb shall be deeply immersed in the liquid, and, having connected the retort with a well-cooled condenser, and also having connected with the receiver a bent glass tube for conducting the uncondensed gases into water, distil, by means of a sand-bath, at a temperature between 150° and 160° C. (302°–320° F.), until oily drops cease to come over, or until a black froth, which forms on the surface, begins to rise in the retort. Separate the yellow, ethereal liquid from the distillate, and expose it to the air for twenty-four hours, in a shallow capsule. Then transfer it to a wet filter, and, when the watery portion has drained off, wash the oil which is left on the filter with the Distilled Water, which should be as cold as possible. When this also has drained off, transfer the oil to a graduated measure, and add to it an equal volume of Ether.

Keep the product in small, glass-stoppered vials, in a cool place.

A transparent, nearly colorless, volatile liquid, of a peculiar, aromatic, ethereal odor, a pungent, refreshing, bitterish taste, and neutral to dry litmus paper.
Specific gravity: 0.910 at 15° C. (59° F.).

Preparation: Spiritus Ætheris Compositus.

OLEUM AMYGDALÆ AMARÆ.**OIL OF BITTER ALMOND.**

A volatile oil obtained from Bitter Almond by maceration with water, and subsequent distillation.

It should be kept in small, well-stoppered bottles, protected from light.

A clear, colorless or yellowish, thin, and strongly refractive liquid, having a peculiar, aromatic odor, and a bitter and burning taste.

Specific gravity : 1.060 to 1.070 at 15° C. (59° F.).

Boiling point : about 180° C. (356° F.). Optically inactive.

Soluble in 300 parts of water at 15° C. (59° F.), and in alcohol or ether in all proportions ; also soluble in nitric acid at ordinary temperatures without the evolution of nitrous vapors.

In the fresh state the Oil is neutral to litmus, but when kept for some time it assumes an acid reaction, due to the formation of benzoic acid.

If 10 drops of the Oil, dissolved in a little alcohol, be shaken with a few drops of a strong solution of sodium hydrate, then with a little ferrous sulphate T.S., and finally mixed with a slight excess of hydrochloric acid, a blue precipitate will be produced (presence of *hydrocyanic acid*).

The presence of *artificial oil containing chlorinated products* may be detected in the following manner. Fold a small strip of filter paper in the form of a taper, saturate it with the Oil, and lay it into a small porcelain capsule. Set this capsule into a larger one, and provide a large beaker to be inverted over the capsule containing the taper. Then, having moistened the inner surface of the beaker with distilled water, ignite the taper, immediately invert the beaker over the capsule, and allow the products of combustion to be absorbed by the water in the beaker. If the beaker be now rinsed with a little distilled water, and the liquid filtered, the filtrate should yield no turbidity with silver nitrate T.S.

If 5 Cc. of the Oil be vigorously shaken, in a flask, with 50 Cc. of a cold, saturated solution of sodium bisulphite, and the mixture heated for a few minutes on a water-bath, the odor of the Oil should disappear, and a nearly clear solution be formed, without the separation of any oily drops on the surface of the liquid (absence of *most other volatile oils* and of *nitrobenzol*).

Preparations : Aqua Amygdalæ Amaræ. Spiritus Amygdalæ Amaræ.

OLEUM AMYGDALÆ EXPRESSUM.**EXPRESSED OIL OF ALMOND.**

A fixed oil expressed from Bitter or Sweet Almond.

It should be kept in well-stoppered bottles, in a cool place.

A clear, pale straw-colored or colorless, oily liquid, almost inodorous, and having a mild, nutty taste.

Specific gravity : 0.915 to 0.920 at 15° C. (59° F.).

Only slightly soluble in alcohol ; soluble in ether and in chloroform in all proportions.

It remains clear at -10° C. (14° F.), and does not congeal until cooled to near -20° C. (-4° F.).

If 2 Cc. of the Oil be vigorously shaken with 1 Cc. of fuming nitric acid and 1 Cc. of water, a whitish, not red or brownish, mixture should be formed,

which, after standing for some hours at about 10° C. (50° F.), should separate into a solid, white mass, and a scarcely colored liquid (distinction from the fixed oils of *apricot* and *peach kernels*, and from *sesamum*, *cotton seed*, and *poppy seed oils*).

If 10 Cc. of the Oil be mixed with 15 Cc. of a 15-per-cent. solution of sodium hydrate and 10 Cc. of alcohol, and the mixture allowed to stand at a temperature of 35° to 40° C. (95° to 104° F.), with occasional agitation, until it becomes clear, and then diluted with 100 Cc. of water, the clear solution thus obtained, upon the subsequent addition of an excess of hydrochloric acid, will set free a layer of oleic acid. This, when separated from the aqueous liquid, washed with warm water, and clarified in a water-bath, will remain liquid at 15° C. (59° F.), although sometimes depositing particles of solid matter and becoming turbid.

One part of this oleic acid, when mixed with 1 volume of alcohol, should give a clear solution, which at 15° C. (59° F.) should not deposit any fatty acids, nor become turbid on the further addition of 1 volume of alcohol (distinction from *olive*, *arachis*, *cotton seed*, *sesamum*, and *other fixed oils*).

Preparation: Unguentum Aquæ Rosæ.

OLEUM ANISI.

OIL OF ANISE.

A volatile oil distilled from Anise.

It should be kept in well-stoppered bottles protected from light, and, if it has separated into a liquid and a solid portion, it should be completely liquefied by warming before being dispensed.

A colorless or pale yellow, thin, and strongly refractive liquid, having the characteristic odor of anise, and a sweetish, mildly aromatic taste.

Specific gravity: about 0.980 to 0.990 at 17° C. (62.6° F.), increasing with age.

At a low temperature, usually between 10° and 15° C. (50°-59° F.), it solidifies to a white, crystalline mass.

Soluble in an equal volume of alcohol to a clear solution (absence of *most fixed oils* and of *oil of turpentine*).

This solution is neutral to litmus paper, and should not assume a blue or brownish color on the addition of a drop of ferric chloride T.S. (absence of some *volatile oils containing phenols*).

When the Oil is dropped into water, without agitation, it should not produce a milky turbidity (absence of *alcohol*).

Preparations: Aqua Anisi. Spiritus Anisi. Spiritus Aurantii Compositus. Tinctura Opii Camphorata.

OLEUM AURANTII CORTICIS.

OIL OF ORANGE PEEL.

A volatile oil obtained by expression from the fresh peel of either the Bitter Orange, *Citrus vulgaris* Risso, or the Sweet Orange, *Citrus Aurantium* Linné (nat. ord. *Rutaceæ*).

It should be kept in well-stoppered bottles, in a cool place.

A pale yellowish liquid, having the characteristic, aromatic odor of orange, and an aromatic and, when obtained from the bitter orange, somewhat bitter taste.

Specific gravity : about 0.850 at 15° C. (59° F.). Its optical rotation should not be less than 95° to the right in a 100 Mm. tube, and at a temperature of about 15° to 20° C. (59° to 68° F.).

Soluble in about four times its volume of alcohol, this solution being neutral to litmus paper ; also soluble, in all proportions, in absolute alcohol or in carbon disulphide, and in an equal volume of glacial acetic acid.

When kept for some time, the Oil should not develop a terebinthinate odor or taste (absence of *oil of turpentine* or of *other oils containing pinene*).

Preparations : Spiritus Aurantii. Spiritus Aurantii Compositus. Spiritus Myrciæ.

OLEUM AURANTII FLORUM.

OIL OF ORANGE FLOWERS.

[OIL OF NEROLI.]

A volatile oil distilled from the fresh flowers of the Bitter Orange, *Citrus vulgaris* Risso (nat. ord. *Rutaceæ*).

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A yellowish or brownish, thin liquid, having a very fragrant odor of orange flowers, and an aromatic, somewhat bitter taste.

Specific gravity : 0.875 to 0.890 at 15° C. (59° F.).

Soluble in an equal volume of alcohol, the solution being neutral to litmus paper.

If a little alcohol be poured on the surface of the Oil, and the mixture gently undulated, a bright, violet fluorescence will usually be observed.

In contact with a saturated solution of sodium bisulphite it assumes a handsome and permanent purplish-red color.

OLEUM BERGAMOTTÆ.

OIL OF BERGAMOT.

[OLEUM BERGAMII, PHARM. 1880.]

A volatile oil obtained by expression from the rind of the fresh fruit of *Citrus Bergamia* Risso et Poiteau (nat. ord. *Rutaceæ*).

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A greenish or greenish-yellow, thin liquid, having a peculiar, very fragrant odor, and an aromatic, bitter taste.

Specific gravity : 0.880 to 0.885 at 15° C. (59° F.). Its optical rotation should not be more than 20° to the right in a 100 Mm. tube, and at a temperature of about 15° to 20° C. (59° to 68° F.).

Two volumes of the Oil, when mixed with 1 volume of alcohol, should give a clear solution of a slightly acid reaction, and this solution should not become turbid on the further addition of alcohol (distinction from *oil of orange* or *oil of lemon*). The Oil should also be soluble at 20° C. (68° F.), without the separation of oily drops, in 1.5 to 2 volumes of alcohol of 80 per cent. by volume. It is soluble, in all proportions, in glacial acetic acid.

If about 2 Gm. of the Oil be evaporated in a small, tared capsule, on a water-bath, until the odor has completely disappeared, a soft, green, homogeneous residue should be left, amounting to not more than about 6 per cent. of the Oil (absence of *fatty oils*).

OLEUM BETULÆ VOLATILE.**VOLATILE OIL OF BETULA.**

[OIL OF SWEET BIRCH.]

A volatile oil obtained by distillation from the bark of *Betula lenta* Linné (Sweet Birch; nat. ord. *Betulaceæ*). It is identical with Methyl Salicylate [$\text{CH}_3\text{C}_7\text{H}_5\text{O}_3$], and nearly identical with Oil of Gaultheria.

It should be kept in well-stoppered bottles, protected from light.

It has the same properties and conforms to the same reactions and tests as Methyl Salicylate (see *Methyl Salicylus*; also *Oleum Gaultheriæ*).

OLEUM CADINUM.**OIL OF CADE.**

[OLEUM JUNIPERI EMPYREUMATICUM.]

A product of the dry distillation of the wood of *Juniperus Oxycedrus* Linné (nat. ord. *Coniferae*).

A brownish or dark brown, clear, thick liquid, having a tarry odor, and an empyreumatic, burning, somewhat bitter taste.

Specific gravity: about 0.990 at 15° C. (59° F.).

It is almost insoluble in water, but imparts to it an acid reaction.

It is only partially soluble in alcohol, but is completely soluble in ether, chloroform, or carbon disulphide.

OLEUM CAJUPUTI.**OIL OF CAJUPUT.**

A volatile oil distilled from the leaves of *Melaleuca Leucadendron* Linné (nat. ord. *Myrtaceæ*).

It should be kept in well-stoppered bottles, in a cool place.

A light, thin, bluish-green, or, after rectification, colorless liquid, having a peculiar, agreeable, distinctly camphoraceous odor, and an aromatic, bitterish taste.

Specific gravity: 0.922 to 0.929 at 15° C. (59° F.).

With an equal volume of alcohol it affords a clear solution, which either has a slightly acid reaction, or, in the case of the rectified Oil, is neutral to litmus paper.

On shaking 5 Cc. of the Oil with 5 Cc. of water containing a drop of diluted hydrochloric acid, the Oil loses its green tint and becomes nearly colorless.

If to this acid liquid, separated from the Oil, a drop of potassium ferrocyanide T.S. be added, a reddish-brown color will usually be produced (presence of traces of *copper*).

If 5 parts of the Oil be heated to 50° C. (122° F.), and 1 part of powdered iodine gradually added, with avoidance of any further rise of temperature, the mixture, on cooling, will deposit a mass of crystals.

OLEUM CARI.**OIL OF CARAWAY.**

A volatile oil distilled from Caraway.

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A colorless, or pale yellow, thin liquid, having the characteristic, aromatic odor of caraway, and a mild, spicy taste.

Specific gravity : 0.910 to 0.920 at 15° C. (59° F.).

Soluble in an equal volume of alcohol, this solution being neutral to litmus paper.

Preparation : Spiritus Juniperi Compositus.

OLEUM CARYOPHYLLI.**OIL OF CLOVES.**

A volatile oil distilled from Cloves.

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A pale yellow, thin liquid, becoming darker and thicker by age and exposure to the air, having a strongly aromatic odor of cloves, and a pungent and spicy taste.

Specific gravity : 1.060 to 1.067 at 15° C. (59° F.).

Soluble in an equal volume of alcohol, this solution being slightly acid to litmus paper ; also soluble in an equal volume of glacial acetic acid.

When shaken with an equal volume of a concentrated solution of potassium hydrate, or of stronger ammonia water, it forms a semi-solid, yellowish mass.

If 2 drops of the Oil be dissolved in 4 Cc. of alcohol, and a drop of ferric chloride T.S. added, a bright green color will be produced ; and if the same test be made with a drop of dilute ferric chloride T.S., prepared by diluting the test-solution with four times its volume of water, a blue color will be produced, which soon changes to yellow.

If 1 Cc. of the Oil be mixed with 2 Cc. of a mixture of 2 volumes of alcohol and 1 volume of water, it should form a clear and perfect solution (absence of *petroleum, most fatty oils, oil of turpentine, and similar oils*).

If 1 Cc. of the Oil be shaken with 20 Cc. of hot water, the water should show a scarcely perceptible acid reaction to litmus paper.

If, after cooling, the aqueous layer be passed through a wet filter, the clear filtrate should yield, with a drop of ferric chloride T.S., only a transient grayish-green, but not a blue or violet color (absence of *carbolic acid*).

OLEUM CHENOPODII.**OIL OF CHENOPodium.**

[OIL OF AMERICAN WORMSEED.]

A volatile oil distilled from Chenopodium.

It should be kept in well-stoppered bottles, in a cool place.

A thin, colorless or yellowish liquid, having a peculiar, penetrating, somewhat camphoraceous odor, and a pungent and bitterish taste.

Specific gravity : about 0.970 at 15° C. (59° F.).

1 Cc. of the Oil should form a perfectly clear solution with 10 Cc. of a mixture of 3 volumes of alcohol and 1 volume of water.

OLEUM CINNAMOMI.

OIL OF CINNAMON.

[OIL OF CASSIA.]

A volatile oil distilled from Cassia Cinnamon.

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A yellowish or brownish liquid, becoming darker and thicker by age and exposure to the air, having the characteristic odor of cinnamon, and a sweetish, spicy, and burning taste.

Specific gravity : 1.055 to 1.065 at 15° C. (59° F.).

Soluble in an equal volume of alcohol, the solution being slightly acid to litmus paper ; also soluble in an equal volume of glacial acetic acid.

When shaken with a saturated solution of sodium bisulphite, it solidifies to a crystalline mass.

If 4 drops of the Oil, contained in a test-tube, be cooled to 0° C. (32° F.), and then shaken with 4 drops of fuming nitric acid, crystalline needles or plates will be formed.

If a portion of the Oil be shaken with water, and the liquid passed through a wet filter, the clear filtrate should give, with a few drops of basic lead acetate T.S., a white turbidity, without a yellow color (absence of *oil of cloves*).

If 4 drops of the Oil be dissolved in 10 Cc. of alcohol, the subsequent addition of a drop of ferric chloride T.S. should produce a brown, but not a green or blue, color (absence of *oil of cloves* or of *carbolic acid*).

If 1 Cc. of the Oil be mixed with 3 Cc. of a mixture of 3 volumes of alcohol and 1 volume of water, a clear solution should result ; and if to this solution there be gradually added 2 Cc. of a saturated solution of lead acetate in a mixture of 3 volumes of alcohol and 1 volume of water, no precipitate should be produced (absence of *petroleum*, or of *colophony*).

Preparations : Aqua Cinnamomi. Spiritus Cinnamomi.

OLEUM COPAIBÆ.

OIL OF COPAIBA.

A volatile oil distilled from Copaiba.

It should be kept in well-stoppered bottles, in a cool place.

A colorless or pale yellowish liquid, having the characteristic odor of copaiba, and an aromatic, bitterish, and pungent taste.

Specific gravity : 0.890 to 0.910 at 15° C. (59° F.), increasing with age.

Soluble in about 10 times its volume of alcohol, forming a slightly turbid liquid, which is neutral to litmus paper.

OLEUM CORIANDRI.

OIL OF CORIANDER.

A volatile oil distilled from Coriander.

It should be kept in well-stoppered bottles, in a cool place.

A colorless or slightly yellowish liquid, having the characteristic, aromatic odor of coriander, and a warm, spicy taste.

Specific gravity : 0.870 to 0.885 at 15° C. (59° F.).

One Cc. of the Oil forms a perfectly clear solution with 3 Cc. of a mixture of 3 volumes of alcohol and 1 volume of water, the solution being neutral to litmus paper. The Oil is also soluble in an equal volume of glacial acetic acid.

Preparations : Confectio Sennæ. Spiritus Aurantii Compositus.

OLEUM CUBEBAE.**OIL OF CUBEB.**

A volatile oil distilled from Cubeb.

It should be kept in well-stoppered bottles, in a cool place.

A colorless, pale greenish, or yellowish liquid, having the characteristic odor of cubeb, and a warm, camphoraceous, aromatic taste.

Specific gravity : about 0.920 at 15° C. (59° F.).

Soluble in an equal volume of alcohol, the solution being neutral to litmus paper.

OLEUM ERIGERONTIS.**OIL OF ERIGERON.**

[OIL OF FLEABANE.]

A volatile oil distilled from the fresh, flowering herb of *Erigeron canadense* Linné (nat. ord. *Compositæ*).

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A pale yellow, limpid liquid, becoming darker and thicker by age and exposure to the air, having a peculiar, aromatic, persistent odor, and an aromatic, slightly pungent taste.

Specific gravity : about 0.850 at 15° C. (59° F.), increasing with age.

Soluble in an equal volume of alcohol (distinction from *oil of fireweed* (derived from *Erechthites hieracifolia* Rafinesque, nat. ord. *Compositæ*) and from *oil of turpentine*), this solution being neutral or slightly acid to litmus ; also soluble in an equal volume of glacial acetic acid.

It distils for the most part between 175° and 180° C. (347° and 356° F.).

OLEUM EUCALYPTI.**OIL OF EUCALYPTUS.**

A volatile oil distilled from the fresh leaves of *Eucalyptus globulus* Labillardière, *Eucalyptus oleosa* F. v. Mueller, and some other species of *Eucalyptus* (nat. ord. *Myrtaceæ*).

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A colorless or faintly yellowish liquid, having a characteristic, aromatic, somewhat camphoraceous odor, and a pungent, spicy, and cooling taste.

Specific gravity : 0.915 to 0.925 at 15° C. (59° F.).

Soluble, in all proportions, in alcohol, carbon disulphide, or glacial acetic acid.

Its alcoholic solution is neutral, or slightly acid, to litmus paper.

If 1 Cc. of the Oil be mixed with 2 Cc. of glacial acetic acid, and 1 or 2 Cc. of a saturated, aqueous solution of sodium nitrite be gradually added, the mixture, when gently stirred, should not form a crystalline mass (distinction from *oils of Eucalyptus* containing a considerable proportion of *phellandrene*).

OLEUM FŒNICULI.

OIL OF FENNEL.

A volatile oil distilled from Fennel.

It should be kept in well-stoppered bottles, in a cool place, and, if it has partly or wholly solidified, it should be completely liquefied by warming before being dispensed.

A colorless or pale yellowish liquid, having the characteristic, aromatic odor of fennel, and a sweetish, mild, and spicy taste.

Specific gravity : not less than 0.960 at 15° C. (59° F.).

Between 5° and 10° C. (41° and 50° F.) it usually solidifies to a crystalline mass, but occasionally it remains liquid at a considerably lower temperature.

Soluble in an equal volume of alcohol, the solution being neutral to litmus paper ; also soluble in an equal volume of glacial acetic acid.

The Oil is not colored by the addition of a drop of ferric chloride T.S. (absence of some foreign oils containing *phenols*, and of *carbolic acid*).

If the Oil be dropped into water, without agitation, it should not produce a milky turbidity (absence of *alcohol*).

Preparations : Aqua Fœniculi. Pulvis Glycyrrhizæ Compositus. Spiritus Juniperi Compositus.

OLEUM GAULTHERIÆ.

OIL OF GAULTHERIA.

[OIL OF WINTERGREEN.]

A volatile oil distilled from the leaves of *Gaultheria procumbens* Linné (Wintergreen ; nat. ord. *Ericaceæ*), consisting almost entirely of Methyl Salicylate [$\text{CH}_3\text{C}_7\text{H}_5\text{O}_3 = 151.64$], and nearly identical with Volatile Oil of Betula.

It should be kept in well-stoppered bottles, protected from light.

A colorless or yellow, or occasionally reddish, liquid, having a characteristic, strongly aromatic odor, and a sweetish, warm, and aromatic taste.

Specific gravity : 1.175 to 1.185 at 15° C. (59° F.).

Boiling point : 218° to 221° C. (424.4° F. to 429.8° F.).

It deviates polarized light slightly to the left.

In other respects it has the same properties and conforms to the same reactions and tests as Methyl Salicylate (see *Methyl Salicylas* ; also *Oleum Betulæ Volatile*).

Preparation : Spiritus Gaultheriæ.

OLEUM GOSSYPII SEMINIS.

COTTON SEED OIL.

A fixed oil expressed from the seed of *Gossypium herbaceum* Linné, and of other species of *Gossypium* (nat. ord. *Malvacæ*), and subsequently purified.

It should be kept in well-closed vessels.

A pale yellow, oily liquid, without odor, and having a bland, nut-like taste. Specific gravity : 0.920 to 0.930 at 15° C. (59° F.).

Very sparingly soluble in alcohol, but readily soluble in ether, chloroform, or carbon disulphide.

On cooling the oil to a temperature below 12° C. (53.6° F.), particles of solid fat will separate. At about 0° to —5° C. (32° to 23° F.), the Oil solidifies.

When the Oil is brought in contact with concentrated sulphuric acid, a dark reddish-brown color is instantly produced.

If 6 Gm. of the Oil be thoroughly shaken, in a test-tube, for about two minutes, with a mixture of 1.5 Gm. of nitric acid and 0.5 Gm. of water, then heated in a bath of boiling water for not more than fifteen minutes, the Oil will assume an orange or reddish-brown color, and, after standing for twelve hours at the ordinary temperature, will form a semi-solid mass.

If 5 Cc. of the Oil be thoroughly shaken, in a test-tube, with 5 Cc. of an alcoholic solution of silver nitrate (made by dissolving 0.1 Gm. of silver nitrate in 10 Cc. of deodorized alcohol and adding 2 drops of nitric acid), and the mixture heated for about five minutes in a water-bath, the Oil will assume a red or reddish-brown color.

OLEUM HEDEOMÆ.

OIL OF HEDEOMA.

[OIL OF PENNYROYAL.]

A volatile oil distilled from Hedeoma.

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A pale yellowish, limpid liquid, having a characteristic, pungent, mint-like odor and taste.

Specific gravity : 0.930 to 0.940 at 15° C. (59° F.).

The Oil should form a perfectly clear solution with twice its volume of a mixture of 3 volumes of alcohol and 1 volume of water, this solution being neutral or slightly acid to litmus paper. It is also readily soluble in carbon disulphide, or in glacial acetic acid.

OLEUM JUNIPERI.

OIL OF JUNIPER.

A volatile oil distilled from the fruit of *Juniperus communis* Linné (nat. ord. *Coniferæ*).

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A colorless or faintly greenish-yellow liquid, becoming darker and thicker by age and exposure to air, having the characteristic odor of juniper, and a warm, aromatic, somewhat terebinthinate and bitterish taste.

Specific gravity : 0.850 to 0.890 at 15° C. (59° F.).

Soluble in about 4 times its volume of alcohol, forming a somewhat turbid liquid, which is neutral or slightly acid to litmus paper. Also soluble in an equal volume of carbon disulphide.

Preparations : Spiritus Juniperi. Spiritus Juniperi Compositus.

OLEUM LAVANDULÆ FLORUM.

OIL OF LAVENDER FLOWERS.

A volatile oil distilled from the fresh flowers of *Lavandula officinalis* Chaix (nat. ord. *Labiatae*).

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A colorless or yellowish liquid, having the fragrant odor of lavender flowers, and a pungent and bitterish taste.

Specific gravity: 0.885 to 0.897 at 15° C. (59° F.).

It is soluble in all proportions in alcohol (distinction from *oil of turpentine*), and in 3 times its volume of a mixture of 3 volumes of alcohol and 1 volume of water (distinction from, and absence of, *oil of turpentine*); it is also soluble in glacial acetic acid. With an equal volume of carbon disulphide it forms a turbid mixture.

The alcoholic solution of the Oil is neutral or slightly acid to litmus paper.

When heated on a water-bath, in a flask provided with a well-cooled condenser, the Oil should yield no distillate having the characters of *alcohol*.

Preparations: Spiritus Lavandulæ. Tinctura Lavandulæ Composita.

OLEUM LIMONIS.

OIL OF LEMON.

A volatile oil obtained by expression from fresh Lemon Peel.

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A pale yellow, limpid liquid, having the fragrant odor of lemon, and an aromatic, somewhat bitterish taste.

Specific gravity: 0.858 to 0.859 at 15° C. (59° F.). Its optical rotation should not be less than 60° to the right in a 100 Min. tube, and at a temperature of about 15° to 20° C. (59° to 68° F.).

Soluble in three times its volume of alcohol, the solution being neutral or slightly acid to litmus paper; also soluble, in all proportions, in absolute alcohol, carbon disulphide, or glacial acetic acid.

When kept for some time, the Oil should not develop a terebinthinate odor or taste (absence of *oil of turpentine* or of *other oils consisting chiefly of pinene*).

Preparations: Spiritus Aurantii Compositus. Spiritus Limonis.

OLEUM LINI.

LINSEED OIL.

[OIL OF FLAXSEED.]

A fixed oil expressed from Linseed without the use of heat.

It should be kept in well-stoppered bottles.

A yellowish or yellow, oily liquid, having a slight, peculiar odor, and a bland taste. When exposed to the air it gradually thickens, and acquires a strong odor and taste; and if spread, in a thin layer, on a glass plate, and allowed to

stand in a warm place, it is gradually converted into a hard, transparent, resin-like mass (absence of *non-drying oils*).

Specific gravity : 0.930 to 0.940 at 15° C. (59° F.).

It does not congeal above —20° C. (—4° F.).

Soluble in about 10 parts of absolute alcohol, and, in all proportions, in ether, chloroform, benzin, carbon disulphide, or oil of turpentine.

It should not more than slightly redden blue litmus paper previously moistened with alcohol (limit of *free acid*).

If 2 Cc. of the Oil be shaken with 1 Cc. of fuming nitric acid and 1 Cc. of water, it should neither completely nor partially solidify, even after standing for one or two days (absence of *non-drying oils*).

If 10 Cc. of the Oil, contained in a small flask, be mixed with a solution of 3 Gm. of potassium hydrate in 5 Cc. of water, then 5 Cc. of alcohol added, and the mixture heated for about five minutes on a water-bath, with occasional agitation, a dark-colored but clear and complete solution should be obtained.

If this liquid be diluted with water to the measure of 50 Cc., then cooled, and shaken with 50 Cc. of ether, the clear, ethereal layer, after having separated, should not show a bluish fluorescence, and, when carefully decanted, and allowed to evaporate spontaneously, should leave not more than a slight, and not oily, residue (absence of *paraffin oils*).

OLEUM MENTHÆ PIPERITÆ.

OIL OF PEPPERMINT.

A volatile oil distilled from Peppermint.

It should be kept in well-stoppered bottles, in a cool place.

A colorless, or yellowish, or greenish-yellow liquid, becoming darker and thicker by age and exposure to the air, having the characteristic, strong odor of peppermint, and a strongly aromatic, pungent taste, followed by a sensation of cold when air is drawn into the mouth.

Specific gravity : 0.900 to 0.920 at 15° C. (59° F.).

The Oil does not fulminate with iodine.

It forms a clear solution with an equal volume of alcohol, becoming turbid when somewhat further diluted, and is soluble, in all proportions, in carbon disulphide, and in glacial acetic acid.

The alcoholic solution of the Oil is neutral to litmus paper.

If 5 drops of the Oil be added to 1 Cc. of glacial acetic acid, and the mixture gently warmed, the liquid will assume a blue color, with a red fluorescence.

If 2 Cc. of the Oil be mixed with 1 Cc. of glacial acetic acid, and 1 drop of nitric acid added, the liquid will soon acquire a green, greenish-blue, blue, or violet tint with a copper-red fluorescence.

If 1 Cc. of the Oil be dissolved in 5 Cc. of alcohol, 0.5 Gm. of sugar and 1 Cc. of hydrochloric acid added, and the mixture gently heated, a deep blue or violet color will gradually be produced.

If to 5 Cc. of nitric acid 1 drop of the Oil be added, and the mixture gently agitated, and allowed to stand for about three hours, it should have a yellowish, but not a bright red, color (absence of *oil of camphor* and of *oil of sassafras*).

If a portion of the Oil, contained in a test-tube, be placed in a freezing mixture of snow (or pounded ice) and salt for fifteen minutes, it should become cloudy and thick, and after the addition of a few crystals of menthol, being still exposed to cold, it should soon form a crystalline mass (distinction from *dementholized oil*).

When heated on a water-bath, in a flask provided with a well-cooled condenser, the Oil should not yield a distillate having the characters of *alcohol*.

Preparations : Aqua Menthæ Piperitæ. Spiritus Menthæ Piperitæ. Trochisci Menthæ Piperitæ.

OLEUM MENTHÆ VIRIDIS.

OIL OF SPEARMINT.

A volatile oil distilled from Spearmint.

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A colorless, yellowish, or greenish-yellow liquid, becoming darker and thicker by age and exposure to the air, having the characteristic, strong odor of spearmint, and a hot, aromatic taste.

Specific gravity : 0.930 to 0.940 at 15° C. (59° F.).

With an equal volume of alcohol it forms a clear solution, which is neutral or slightly acid to litmus paper. When somewhat further diluted with alcohol, it becomes turbid. It also yields a clear solution with an equal volume of glacial acetic acid, and with half its volume of carbon disulphide ; but with an equal volume of the latter it forms a turbid mixture.

Preparations : Aqua Menthæ Viridis. Spiritus Menthæ Viridis.

OLEUM MORRHUÆ.

COD LIVER OIL.

[OLEUM JECORIS ASELLI.]

A fixed oil obtained from the fresh livers of *Gadus Morrhua* Linné, and of other species of *Gadus* (class *Pisces* ; order *Teleostei* ; family *Gadidae*).

It should be kept in well-stoppered and perfectly dry bottles.

A pale yellow, thin, oily liquid, having a peculiar, slightly fishy, but not rancid odor, and a bland, slightly fishy taste.

Specific gravity : 0.920 to 0.925 at 15° C. (59° F.).

Scarcely soluble in alcohol, but readily soluble in ether, chloroform, or carbon disulphide ; also in 2.5 parts of acetic ether.

If 1 drop of the Oil be dissolved in 20 drops of chloroform, and the solution shaken with 1 drop of sulphuric acid, the solution will acquire a violet-red tint, rapidly changing to rose-red and brownish-yellow.

If a glass rod, moistened with sulphuric acid, be drawn through a few drops of the Oil, on a porcelain plate, a violet color will be produced.

Cod Liver Oil should be only very slightly acid to litmus paper previously moistened with alcohol (limit of *free fatty acids*).

When the Oil is allowed to stand for some time at 0° C. (32° F.), very little or no solid fat should separate (absence of *other fish oils*, and of *many vegetable oils*).

If 2 or 3 drops of fuming nitric acid be allowed to flow alongside of 10 or 15 drops of the Oil, contained in a watch-glass, a red color will be produced at the point of contact. On stirring the mixture with a glass rod, this color becomes bright rose-red, soon changing to lemon-yellow (distinction from *scal oil*, which shows at first no change of color, and from *other fish oils*, which become at first blue, and afterwards brown and yellow).

OLEUM MYRCIÆ.**OIL OF MYRCIA.**

[OIL OF BAY.]

A volatile oil distilled from the leaves of *Myrcia acris* De Candolle (nat. ord. *Myrtaceæ*).

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A yellow or brownish-yellow liquid, having an aromatic, somewhat clove-like odor, and a pungent, spicy taste.

Specific gravity : 0.975 to 0.990 at 15° C. (59° F.).

With an equal volume of alcohol, glacial acetic acid, or carbon disulphide, it yields slightly turbid solutions. The alcoholic solution is slightly acid to litmus paper.

When mixed with an equal volume of a concentrated solution of sodium hydrate, it forms a semi-solid mass.

If 2 drops of the Oil be dissolved in 4 Cc. of alcohol, and a drop of ferric chloride T.S. be added, a light green color will be produced ; and if the same test be made with a drop of diluted ferric chloride T.S., prepared by diluting the test-solution with four times its volume of water, a light bluish coloration will be produced, which soon disappears.

If to 3 drops of the Oil, contained in a small test-tube, 3 drops of concentrated sulphuric acid be added, and, after the tube has been corked, the mixture be allowed to stand for half an hour, a resinous mass will be obtained.

On adding to this mass 4 Cc. of diluted alcohol, vigorously shaking the mixture, and gradually heating to the boiling point, the liquid should remain nearly colorless, and should not acquire a red or purplish-red color (distinction from *oil of pimenta* and *oil of cloves*).

If 1 Cc. of the Oil be shaken with 20 Cc. of hot water, the water should not give more than a scarcely perceptible acid reaction with litmus paper.

If, after cooling, the liquid be passed through a wet filter, the clear filtrate should produce, with a drop of ferric chloride T.S., only a transient grayish-green, but not a blue or violet, color (absence of *carbolic acid*).

Preparation : Spiritus Myrciæ.

OLEUM MYRISTICÆ.**OIL OF NUTMEG.**

A volatile oil distilled from Nutmeg.

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A thin, colorless or pale yellowish liquid, having the characteristic odor of nutmeg, and a warm, spicy taste. It becomes darker and thicker by age and exposure to the air.

Specific gravity : 0.870 to 0.900 at 15° C. (59° F.).

Soluble in an equal volume of alcohol, the solution being neutral to litmus paper ; also soluble in an equal volume of glacial acetic acid, and in carbon disulphide in all proportions.

Preparation : Spiritus Myristicæ.

OLEUM OLIVÆ.

OLIVE OIL.

A fixed oil expressed from the ripe fruit of *Olea europæa* Linné (nat. ord. *Oleaceæ*).

It should be kept in well-stoppered bottles, in a cool place.

A pale yellow, or light greenish-yellow, oily liquid, having a slight, peculiar odor, and a nutty, oleaginous taste, with a faintly acrid after-taste.

Specific gravity : 0.915 to 0.918 at 15° C. (59° F.).

Very sparingly soluble in alcohol, but readily soluble in ether, chloroform, or carbon disulphide.

When cooled to about 10° C. (50° F.), the Oil begins to become somewhat cloudy from the separation of crystalline particles, and at 0° C. (32° F.) it forms a whitish, granular mass.

If 10 Cc. of the Oil be shaken frequently, during two hours, with a freshly prepared solution of 1 Gm. of mercury in 3 Cc. of nitric acid, a perfectly solid mass of a pale straw color will be obtained.

If 6 Gm. of the Oil be thoroughly shaken, in a test-tube, for about two minutes, with a mixture of 1.5 Gm. of nitric acid and 0.5 Gm. of water, then heated in a bath of boiling water for not more than fifteen minutes, the Oil should retain a light yellow color, not becoming orange or reddish-brown, and, after standing at the ordinary temperature for about twelve hours, it should form a perfectly solid, light yellowish mass (absence of appreciable quantities of *cotton seed oil*, and *most other seed oils*).

If 5 Cc. of the Oil be thoroughly shaken, in a test-tube, with 5 Cc. of an alcoholic solution of silver nitrate (prepared by dissolving 0.1 Gm. of silver nitrate in 10 Cc. of deodorized alcohol, and adding 2 drops of nitric acid), and the mixture be heated for about five minutes in a water-bath, the Oil should retain its original, pale yellow color, not becoming reddish or brown, nor should any dark color be produced at the line of contact of the two liquids (absence of more than about 5 per cent. of *cotton seed oil* and of *many other foreign oils*).

If 30 Cc. of the Oil be saponified by heating with 20 Cc. of alcohol and 5 Gm. of potassa, the liquid then diluted with 200 Cc. of water, and freed from alcohol by boiling, on supersaturating the solution with diluted sulphuric acid, the fatty acids will form a layer on the surface. If these be separated as far as possible, free from water, and filtered, 5 Cc. of the clear filtrate, when shaken in a test-tube with 5 Cc. of concentrated hydrochloric acid, should not color the latter green; and, on the subsequent addition of about 0.5 Gm. of sugar, and again shaking the mixture, no violet or crimson tint should be produced in the acid layer within fifteen minutes (absence of *sesamum oil*).

OLEUM PHOSPHORATUM.

PHOSPHORATED OIL.

Phosphorus, one gramme 1 Gm.

Expressed Oil of Almond,

Ether, each, a sufficient quantity,

To make one hundred grammes. . . . 100 Gm.

Introduce a sufficient quantity of Expressed Oil of Almond into a flask, heat it on a sand-bath to 250° C. (482° F.), and keep it at that temperature for fifteen minutes. Then allow it to cool, and filter it. Put ninety (90) grammes of the filtered Oil together with the Phosphorus, previously well dried by filtering paper, into a dry, tared

bottle capable of holding about *one hundred and twenty* (120) *cubic centimeters*, insert the stopper, and heat the bottle in a water-bath until the Phosphorus melts. Then agitate it until the Phosphorus is dissolved, allow it to cool, add enough Ether to make the mixture weigh *one hundred* (100) *grammes*, and agitate it again. Lastly, transfer the solution to small glass-stoppered vials, which should be completely filled and kept in a cool and dark place.

A clear, yellowish liquid, having the odor of phosphorus and of ether, but not phosphorescent in the dark.

It should be perfectly free from any particles of undissolved phosphorus.

OLEUM PICIS LIQUIDÆ.

OIL OF TAR.

A volatile oil distilled from Tar.

An almost colorless liquid when freshly distilled, but soon acquiring a dark reddish-brown color, and having a strong, tarry odor and taste.

Specific gravity : about 0.970 at 15° C. (59° F.).

It is readily soluble in alcohol, the solution being acid to litmus paper.

OLEUM PIMENTÆ.

OIL OF PIMENTA.

[OIL OF ALLSPICE.]

A volatile oil distilled from Pimenta.

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A colorless or pale yellow liquid, having a strong, aromatic, clove-like odor, and a pungent, spicy taste. It becomes darker and thicker by age and exposure to the air.

Specific gravity : 1.045 to 1.055 at 15° C. (59° F.).

With an equal volume of alcohol it forms a clear solution, which is slightly acid to litmus paper. It also forms a clear solution with an equal volume of glacial acetic acid, and a nearly clear solution with an equal volume of carbon disulphide.

When mixed with an equal volume of a concentrated solution of sodium hydrate, it forms a semi-solid mass.

If 2 drops of the Oil be dissolved in 4 Cc. of alcohol, and a drop of ferric chloride T.S. added, a bright green color will be produced ; and if the same tests be made with a drop of diluted ferric chloride T.S., prepared by diluting the test-solution with four times its volume of water, a blue color will be produced, changing to green, and soon becoming yellow.

If 1 Cc. of the Oil be shaken with 20 Cc. of hot water, the water should not give more than a scarcely perceptible acid reaction with litmus paper.

If, after cooling, the liquid be passed through a wet filter, the clear filtrate should produce, with a drop of ferric chloride T.S., only a transient grayish-green, but not a blue or violet, color (absence of *carbolic acid*).

Preparation : Spiritus Myrciæ.

OLEUM RICINI.

CASTOR OIL.

A fixed oil expressed from the seed of *Ricinus communis* Linné (nat. ord. *Euphorbiaceæ*).

It should be kept in well-stoppered bottles.

A pale yellowish or almost colorless, transparent, viscid liquid, having a faint, mild odor, and a bland, afterwards slightly acrid, and generally offensive taste.

Specific gravity : 0.950 to 0.970 at 15° C. (59° F.).

Soluble in an equal volume of alcohol, and, in all proportions, in absolute alcohol, or in glacial acetic acid ; also soluble, at 15° C. (59° F.), in 3 times its volume of a mixture of 19 volumes of alcohol and 1 volume of water (absence of more than about 5 per cent. of *most other fixed oils*).

With an equal volume of benzin, it forms, at 15° C. (59° F.), a turbid mixture, but at 17° C. (62.6° F.) it yields a clear solution.

When exposed to the air in a thin layer, it slowly dries to a varnish-like film.

When cooled to 0° C. (32° F.), it becomes turbid, with the separation of crystalline flakes, and at about -18° C. (-0.4° F.) it congeals to a yellowish mass.

If 3 Cc. of the Oil be shaken for a few minutes with 3 Cc. of carbon disulphide and 1 Cc. of sulphuric acid, the mixture should not acquire a blackish-brown color (absence of *many foreign oils*).

OLEUM ROSÆ.

OIL OF ROSE.

A volatile oil distilled from the fresh flowers of *Rosa damascena* Miller (nat. ord. *Rosaceæ*).

It should be kept in well-stoppered vials, in a cool place, protected from light. When dispensed, it should be completely liquefied by warming, if necessary, and well mixed by agitation.

A pale yellowish, transparent liquid, having the strong, fragrant odor of rose, and a mild, slightly sweetish taste.

Specific gravity : 0.865 to 0.880 at 20° C. (68° F.).

It is but slightly soluble in alcohol, and neutral to litmus paper moistened with alcohol.

The congealing and melting points of the Oil are subject to some variation, depending upon the amount of stearopten, but, when slowly cooled to a temperature, usually, between 16° and 21° C. (60.8° and 69.8° F.), it becomes a transparent solid, interspersed with numerous slender, shining, iridescent, scale-like crystals. Upon the application of the heat of the hand, the crystals should float in the upper portion of the liquefied Oil.

If to 5 drops of the Oil, contained in a test-tube, 5 drops of concentrated sulphuric acid be added, a reddish-brown, thick mixture will be produced, but no white fumes or tarry odor should be developed, and the fragrant odor of the Oil should not be destroyed. If this mixture be then shaken with 2 Cc. of alcohol, the resulting liquid may be turbid, but should be nearly colorless, and should not at once assume a red or reddish-brown color (absence of *oil of ginger-grass* or *Turkish oil of geranium*, from *Andropogon Schœnanthus* Linné (nat. ord. *Gramineæ*), and of *oil of rose geranium*, from *Pelargonium Radula* (Cavanilles) Aiton, *Pelargonium capitatum* (Linné) Aiton, and *Pelargonium odoratissimum* (Linné) Aiton ; nat. ord. *Geraniaceæ*).

OLEUM ROSMARINI.**OIL OF ROSEMARY.**

A volatile oil distilled from the leaves of *Rosmarinus officinalis* Linné (nat. ord. *Labiatae*).

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A colorless or pale yellow, limpid liquid, having the characteristic, pungent odor of rosemary, and a warm, somewhat camphoraceous taste.

Specific gravity : 0.895 to 0.915 at 15° C. (59° F.).

Soluble in an equal volume of alcohol, the solution being neutral, or very slightly acid, to litmus paper ; also soluble in an equal volume of glacial acetic acid.

Preparation : Tinctura Lavandulae Composita.

OLEUM SABINÆ.**OIL OF SAVINE.**

A volatile oil distilled from Savine.

It should be kept in well-stoppered bottles, protected from light.

A colorless or yellowish liquid, having a peculiar terebinthinate odor, and a pungent, bitterish, and camphoraceous taste. It becomes darker and thicker by age and exposure to the air.

Specific gravity : 0.910 to 0.940 at 15° C. (59° F.).

Soluble in an equal volume of alcohol (distinction from *oil of juniper* and *oil of turpentine*), the solution being neutral to litmus paper ; also soluble in an equal volume of glacial acetic acid.

OLEUM SANTALI.**OIL OF SANTAL.**

[OIL OF SANDAL WOOD.]

A volatile oil distilled from the wood of *Santalum album* Linné (nat. ord. *Santalaceae*).

Oil of Santal should be kept in well-stoppered bottles, in a cool place, protected from light.

A pale yellowish or yellow, somewhat thickish liquid, having a peculiar, strongly aromatic odor, and a pungent, spicy taste.

Specific gravity : 0.970 to 0.978 at 15° C. (59° F.).

It deviates polarized light to the left (distinction from *Australian* (spec. grav. 0.953) and *West Indian* (spec. grav. 0.965) *Sandal Wood Oil*, which deviate polarized light to the right).

Readily soluble in alcohol, the solution being slightly acid to litmus paper.

If to 1 Cc. of the Oil, at 20° C. (68° F.), there be added 10 Cc. of a mixture of 3 volumes of alcohol and 1 volume of water, a perfectly clear solution should be obtained (test for *cedarwood oil*, *castor oil* and *other fatty oils*, etc.).

OLEUM SASSAFRAS.**OIL OF SASSAFRAS.**

A volatile oil distilled from *Sassafras*.

It should be kept in well-stoppered bottles, protected from light.

A yellowish or reddish-yellow liquid, having the characteristic odor of *sassafras* without the odor of camphor, and a warm, aromatic taste. It becomes darker and thicker by age and exposure to the air.

Specific gravity : 1.070 to 1.090 at 15° C. (59° F.).

Soluble, in all proportions, in alcohol, the solution being neutral to litmus paper; also soluble, in all proportions, in glacial acetic acid, and in carbon disulphide.

If to 5 drops of the Oil 5 drops of nitric acid be added, a violent reaction will take place, producing at first a red color, and finally converting the Oil into a red resin.

If to a few drops of the Oil a drop of sulphuric acid be added, a deep-red color will be produced at first, which soon becomes blackish.

OLEUM SESAMI.**OIL OF SESAMUM.**

[SESAME OIL. TEEL OIL. BENNE OIL.]

A fixed oil expressed from the seed of *Sesamum indicum* Linné (nat. ord. *Pedaliacæ*).

It should be kept in well-stoppered bottles.

A yellowish or yellow, oily liquid, inodorous or nearly so, and having a bland, nut-like taste.

Specific gravity : 0.919 to 0.923 at 15° C. (59° F.).

When cooled to -3° C. (26.6° F.) it becomes thick, and at -5° C. (23° F.) it congeals to a yellowish-white mass.

Concentrated sulphuric acid converts it into a brownish-red jelly.

If 5 Cc. of the Oil be shaken with an equal volume of concentrated hydrochloric acid, the latter will usually assume a bright emerald-green color, especially if the Oil has been exposed for some time to the action of air and light; and, on the subsequent addition of about 0.5 Gm. of sugar, and again shaking the mixture, a blue color, changing to violet, and finally to deep crimson, will be produced.

OLEUM SINAPIS VOLATILE.**VOLATILE OIL OF MUSTARD.**

A volatile oil obtained from Black Mustard by maceration with water and subsequent distillation.

It should be carefully kept in well-stoppered bottles, in a cool place, protected from light.

A colorless or pale yellow, limpid, and strongly refractive liquid, having a very pungent and acrid odor and taste.

Specific gravity : 1.018 to 1.029 at 15° C. (59° F.).

Boiling point : 148° to 150° C. (298.4° to 302° F.).

Freely soluble in alcohol, ether, or carbon disulphide, the solutions being neutral to litmus paper.

If to 3 Gm. of the Oil 6 Gm. of sulphuric acid be gradually added, the liquid being kept cool, the mixture, upon subsequent agitation, will evolve sulphur dioxide, but will remain of a light yellow color, and at first perfectly clear, becoming afterwards thick and occasionally crystalline, while the pungent odor of the Oil will disappear.

If a portion of the Oil be heated in a flask connected with a well-cooled condenser, it should distil completely between 148° and 150° C. (298.4° and 302° F.), and both the first and the last portion of the distillate should have the same specific gravity as the original Oil (absence of *alcohol*, *chloroform*, *carbon disulphide*, *petroleum*, or *fatty oils*).

If a small portion of the Oil be diluted with 5 times its volume of alcohol, and a drop of ferric chloride T.S. be added, no blue or violet color should be produced (absence of *phenols*).

If a mixture of 3 Gm. of the Oil and 3 Gm. of alcohol be shaken, in a small flask, with 6 Gm. of ammonia water, it will become clear after standing for some hours, or rapidly when warmed to 50° C. (122° F.), and usually deposit, without becoming colored, crystals of thiosinamine (allyl-thio-urea, $\text{CS.N}_2\text{H}_3(\text{C}_3\text{H}_5)$).

To determine the proportion of thiosinamine obtainable from the Oil, decant the mother-water from the crystals, and evaporate it gradually in a tared capsule, on a water-bath, adding fresh portions only after the ammoniacal odor of each preceding portion has disappeared. Then add the crystals from the flask to those in the capsule, rinsing them out of the flask with a little alcohol, and heat the capsule on a water-bath until its weight remains constant. The amount of thiosinamine thus obtained from 3 Gm. of the Oil should be not less than 3.25 Gm., nor more than 3.5 Gm. After cooling, thiosinamine forms a brownish, crystalline mass, fusing at 70° C. (158° F.), and having a leek-like, but no pungent, odor. The mass should be soluble in 2 parts of warm water, forming a solution which should not redden blue litmus paper, and which possesses a somewhat bitter, not persistent taste.

Preparation: Linimentum Sinapis Compositum.

OLEUM TEREBINTHINÆ.

OIL OF TURPENTINE.

A volatile oil distilled from Turpentine.

Oil of Turpentine should be kept in well-stoppered bottles, protected from light.

A thin, colorless liquid, having a characteristic odor and taste, both of which become stronger and less pleasant by age and exposure to the air.

Specific gravity: 0.855 to 0.870 at 15° C. (59° F.).

It boils at 155° to 170° C. (311° to 338° F.).

Soluble in 3 times its volume of alcohol, the solution being neutral or slightly acid to litmus paper; also soluble in an equal volume of glacial acetic acid.

Bromine or powdered iodine acts violently upon it.

When brought in contact with a mixture of nitric and sulphuric acids, it takes fire.

If a little of the Oil be evaporated in a small capsule on a water-bath, it should leave not more than a very slight residue (absence of *petroleum*, *paraffin oils*, or *resin*).

Preparations: Linimentum Terebinthinæ. Oleum Terebinthinæ Rectificatum.

OLEUM TEREBINTHINÆ RECTIFICATUM. RECTIFIED OIL OF TURPENTINE.

Oil of Turpentine, *a convenient quantity.*

Lime Water, *a sufficient quantity.*

Shake the Oil thoroughly with *six* (6) *times* its volume of Lime Water, and introduce the mixture into a copper still connected with a well-cooled condenser. Then distil, until about *three-fourths* of the Oil have passed over, and separate the clear Oil from the water. Keep the product in well-stoppered bottles, in a cool place, protected from light.

Rectified Oil of Turpentine should always be dispensed when Oil of Turpentine is required for internal use.

A thin, colorless liquid, having the general properties mentioned under Oil of Turpentine (see *Oleum Terebinthinæ*).

Specific gravity: 0.855 to 0.865 at 15° C. (59° F.).

Boiling point: about 160° C. (320° F.).

Its alcoholic solution should be neutral to litmus paper.

If about 10 Cc. of the Oil be evaporated in a capsule on a water-bath, no weighable residue should be left.

OLEUM THEOBROMATIS. OIL OF THEOBROMA.

[OLEUM THEOBROMÆ, PHARM. 1880. BUTTER OF CACAO.]

A fixed oil expressed from the seed of *Theobroma Cacao* Linné (nat. ord. *Sterculiaceæ*).

A yellowish-white solid, having a faint, agreeable odor, and a bland, chocolate-like taste.

Specific gravity: 0.970 to 0.980 at 15° C. (59° F.).

Readily soluble in ether or chloroform; also soluble in 100 parts of cold and in 20 parts of boiling absolute alcohol, all these solutions being neutral to litmus paper.

It is brittle at 15° C. (59° F.), and melts at 30° to 33° C. (86° to 91.4° F.) to a clear liquid.

If 1 Gm. of Oil of Theobroma be dissolved in 3 Cc. of ether, in a test-tube, at a temperature of 17° C. (63° F.), and the tube subsequently plunged into water at 0° C. (32° F.), the liquid should not become turbid, nor deposit a granular mass in less than three minutes; and if the mixture, after congealing, be exposed to a temperature of 15° C. (59° F.), it should gradually form a perfectly clear liquid (absence of *paraffin*, *wax*, *stearin*, *tallow*, etc.).

OLEUM THYMI. OIL OF THYME.

A volatile oil distilled from the leaves and flowering tops of *Thymus vulgaris* Linné (nat. ord. *Labiataæ*).

It should be kept in well-stoppered bottles, in a cool place, protected from light.

A yellowish or yellowish-red liquid, having a strong odor of thyme, and an aromatic, pungent, afterwards cooling taste. It becomes darker and thicker by age and exposure to the air.

Specific gravity : 0.900 to 0.930 at 15° C. (59° F.).

It does not fulminate with iodine.

The Oil is soluble in half its volume of alcohol, forming a clear solution which is neutral or only very slightly acid to litmus paper. The Oil is also soluble, in all proportions, in carbon disulphide, and in glacial acetic acid.

With a drop of ferric chloride T.S. the Oil yields a greenish-brown color, which changes to reddish.

If 1 Cc. of the Oil be shaken with 10 Cc. of hot water, and, after cooling, the liquid be passed through a wet filter, the filtrate should not assume, with a drop of ferric chloride T.S., a bluish or violet color (absence of *carbolic acid*).

OLEUM TIGLII.

CROTON OIL.

A fixed oil expressed from the seed of *Croton Tiglium* Linné (nat. ord. *Euphorbiaceæ*).

Croton Oil should be kept in small, well-stoppered bottles, and should be handled with caution.

A pale yellow or brownish-yellow, somewhat viscid, and slightly fluorescent liquid, having a slight, fatty odor, and a mild, oily, afterwards acrid and burning taste (*great caution is necessary in tasting*).

When applied to the skin, it produces rubefaction or a pustular eruption.

Specific gravity : 0.940 to 0.960 at 15° C. (59° F.).

It reddens blue litmus paper moistened with alcohol.

When fresh, it is soluble in about 60 parts of alcohol, the solubility increasing by age.

It is freely soluble in ether, chloroform, carbon disulphide, and in fixed or volatile oils.

When gently heated with twice its volume of absolute alcohol, it forms a clear solution from which the Oil usually separates on cooling.

If to 2 Cc. of the Oil 1 Cc. of fuming nitric acid and 1 Cc. of water be added, and the mixture vigorously shaken, it should not solidify, either completely or partially, after standing for one or two days (absence of *other non-drying oils*).

OPII PULVIS.

POWDERED OPIUM.

Opium, dried at a temperature not exceeding 85° C. (185° F.), and reduced to a very fine (No. 80) powder.

Powdered Opium, for pharmaceutical or medicinal purposes, when assayed by the process given under Opium, should yield not less than *thirteen* (13) nor more than *fifteen* (15) *per cent.* of crystallized morphine. Any Powdered Opium of a higher percentage may be brought within these limits by admixture with Powdered Opium of a lower percentage, in proper proportions.

Preparations : Acetum Opii. Extractum Opii. Opium Deodoratum. Pilulæ Opii. Pulvis Ipecacuanhæ et Opii. Tinctura Opii. Tinctura Opii Camphorata. Tinctura Opii Deodorati. Trochisci Glycyrrhizæ et Opii. Vinum Opii.

OPIUM.

OPIUM.

The concrete, milky exudation obtained by incising the unripe capsules of *Papaver somniferum* Linné (nat. ord. *Papaveraceæ*), and yielding, in its normal, moist condition, not less than *nine (9) per cent.* of crystallized morphine, when assayed by the process given below.

In irregular or subglobular cakes, with the remnants of poppy leaves and fruits of a species of *Rumex* adhering to the surface; plastic, or of a harder consistence; chestnut-brown or darker, and somewhat shining; internally showing some tears and fragments of vegetable tissue. It has a sharp, narcotic odor, and a peculiar, bitter taste.

Assay of Opium.

Opium, in any condition to be valued, *ten grammes* 10 Gm.
 Ammonia Water, *three and five-tenths cubic centimeters* 3.5 Cc.
 Alcohol,
 Ether,
 Water, each, *a sufficient quantity*.

Introduce the Opium (which, if fresh, should be in very small pieces, and if dry, in very fine powder) into a bottle having a capacity of about 300 Cc., add 100 Cc. of water, cork it well, and agitate frequently during twelve hours. Then pour the whole as evenly as possible upon a wetted filter having a diameter of 12 Cm., and, when the liquid has drained off, wash the residue with water, carefully dropped upon the edges of the filter and the contents, until 150 Cc. of filtrate are obtained. Then carefully transfer the moist Opium back to the bottle by means of a spatula, add 50 Cc. of water, agitate thoroughly and repeatedly during fifteen minutes, and return the whole to the filter. When the liquid has drained off, wash the residue, as before, until the second filtrate measures 150 Cc., and finally collect about 20 Cc. more of a third filtrate. Evaporate in a tared capsule, first, the second filtrate to a small volume, then add the first filtrate, rinsing the vessel with the third filtrate, and continue the evaporation until the residue weighs 14 Gm. Rotate the concentrated solution about in the capsule until the rings of extract are redissolved, pour the liquid into a tared Erlenmeyer flask having a capacity of about 100 Cc., and rinse the capsule with a few drops of water at a time, until the entire solution weighs 20 Gm. Then add 10 Gm. (or 12.2 Cc.) of alcohol, shake well, add 25 Cc. of ether, and shake again. Now add the ammonia water from a graduated pipette or burette, stopper the flask with a sound cork, shake it thoroughly during ten minutes, and then set it aside, in a moderately cool place, for at least six hours, or over night.

Remove the stopper carefully, and, should any crystals adhere to it, brush them into the flask. Place in a small funnel two rapidly-acting filters, of a diameter of 7 Cm., plainly folded, one within the other (the triple fold of the inner filter being laid against the single side of the outer filter), wet them well with ether, and decant the ethereal solution as completely as possible upon the inner filter. Add 10 Cc. of ether to the contents of the flask, rotate it, and again decant the ethereal layer upon the inner filter. Repeat this operation with another portion of 10 Cc. of ether. Then pour into the filter the liquid in the flask, in portions, in such a way as to transfer the greater portion of the crystals to the filter, and, when this has passed through, transfer the remaining crystals to the filter by washing the flask with several portions of water, using not more than about 10 Cc. in all. Allow the double filter to drain, then apply water to the crystals, drop by drop, until they are practi-

cally free from mother-water, and afterwards wash them, drop by drop, from a pipette, with alcohol previously saturated with powdered morphine. When this has passed through, displace the remaining alcohol by ether, using about 10 Cc., or more if necessary. Allow the filter to dry in a moderately warm place, at a temperature not exceeding 60° C. (140° F.), until its weight remains constant, then carefully transfer the crystals to a tared watch-glass and weigh them.

The weight found, multiplied by 10, represents the percentage of crystallized morphine obtained from the Opium.

OPIUM DEODORATUM.

DEODORIZED OPIUM.

[OPIUM DENARCOTISATUM, PHARM. 1880.]

Powdered Opium, containing 13 to 15 per cent. of morphine, <i>one hundred grammes</i>	100 Gm.
Ether, <i>fourteen hundred cubic centimeters</i>	1400 Cc.
Sugar of Milk, recently dried and in fine powder, <i>a sufficient quantity</i> ,	
To make <i>one hundred grammes</i>	100 Gm.

Macerate the Powdered Opium with *seven hundred (700) cubic centimeters* of Ether, in a well-closed flask, during twenty-four hours, agitating from time to time. Pour off the clear, ethereal solution as far as possible, and repeat the maceration with two further portions of Ether, each of *three hundred and fifty (350) cubic centimeters*, first for twelve hours, and the last time for two hours. Collect the residue in a weighed dish, dry it, first by a very gentle heat, and finally at a temperature not exceeding 85° C. (185° F.), and mix it thoroughly, by trituration, with enough Sugar of Milk to make the product weigh *one hundred (100) grammes*.

PANCREATINUM.

PANCREATIN.

A mixture of the enzymes naturally existing in the pancreas of warm-blooded animals, usually obtained from the fresh pancreas of the hog (*Sus scrofa* Linné; class *Mammalia*; order *Pachydermata*).

A yellowish, yellowish-white, or grayish, amorphous powder, odorless, or having a faint, peculiar, not unpleasant odor, and a somewhat meat-like taste. Slowly and almost completely soluble in water, insoluble in alcohol.

Pancreatin digests albuminoids, and converts starch into sugar; prolonged contact with mineral acids renders it inert.

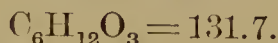
If there be added to 100 Cc. of tepid water contained in a flask, 0.28 Gm. of Pancreatin and 1.5 Gm. of sodium bicarbonate, and afterwards 400 Cc. of

fresh cow's milk previously heated to 38° C. (100.4° F.), and if this mixture be maintained at the same temperature for thirty minutes, the milk should be so completely peptonized, that, if a small portion of it be transferred to a test-tube and mixed with some nitric acid, no coagulation should occur.

Peptonized milk, prepared in the manner just described, or even when the process is allowed to go on to the development of a very distinct, bitter flavor, should not have an odor suggestive of rancidity.

PARALDEHYDUM.

PARALDEHYDE.



A polymeric form of Ethylic Aldehyde [$\text{C}_2\text{H}_4\text{O} = 43.9$].

Paraldehyde should be kept in well-stoppered, dark amber-colored bottles, in a cool place.

A colorless, transparent liquid, having a strong, characteristic, but not unpleasant or pungent odor, and a burning and cooling taste.

Soluble in 8.5 parts of water at 15° C. (59° F.), and in 16.5 parts of boiling water; miscible, in all proportions, with alcohol, ether, and fixed or volatile oils.

When cooled to near 0° C. (32° F.), Paraldehyde solidifies to a crystalline mass, which becomes liquid again at 10.5° C. (51° F.). It boils at 123°–125° C. (253.4°–257° F.), giving off inflammable vapors.

Paraldehyde is neutral, or slightly acid, to litmus paper.

When distilled with a small portion of sulphuric acid, Paraldehyde is converted into ordinary aldehyde, boiling at about 21° C. (70° F.). On warming some silver ammonium nitrate T.S. saturated with Paraldehyde, in a test-tube, a silver mirror will form on standing.

On heating some Paraldehyde on a water-bath, it should completely volatilize, without leaving any disagreeable odor (absence of *aldehyde derived from fusel oil*).

One Cc. of Paraldehyde should form, with 10 Cc. of water, a clear solution, free from oily drops (absence of *amylic alcohol*, etc.), and this solution, when acidulated with nitric acid, should not be affected by silver nitrate T.S. (absence of *hydrochloric acid*), or barium chloride T.S. (absence of *sulphuric acid*).

A mixture of 8 Cc. of Paraldehyde and 8 Cc. of alcohol with 1 drop of phenolphthalein T.S. should acquire a pink color upon the addition of 0.5 Cc. of normal potassium hydrate T.S. (limit of *free acid*).

PAREIRA.

PAREIRA.

[PAREIRA BRAVA.]

The root of *Chondodendron tomentosum* Ruiz et Pavon (nat. ord. *Menispermaceæ*).

In subcylindrical, somewhat tortuous pieces, about 10 to 15 Cm. long, varying in thickness from 2 to 10 Cm.; externally dark brownish-gray, with transverse ridges and fissures and longitudinal furrows; internally pale brown, and, when freshly cut, having a waxy lustre; bark thin; wood porous, in two or more somewhat irregularly concentric circles, with rather large medullary rays, and no distinct central pith; inodorous; taste bitter.

Pieces having a bright yellow color, or the woody portion of which is grayish, hard, and nearly tasteless, should be rejected.

Preparation: Extractum Pareiræ Fluidum.

PEPO.

PUMPKIN SEED.

The seed of *Cucurbita Pepo* Linné (nat. ord. *Cucurbitaceæ*).

About 2 Cm. long, broadly-ovate, flat, white or whitish, nearly smooth, with a shallow groove parallel to the edge; containing a short, conical radicle and two flat cotyledons; inodorous; taste bland and oily.

PEPSINUM.

PEPSIN.

A proteolytic ferment or enzyme obtained from the glandular layer of fresh stomachs from healthy pigs, and capable of digesting not less than 3000 times its own weight of freshly coagulated and disintegrated egg albumen, when tested by the process given below.

If it be desired to use a diluent for reducing Pepsin of a higher digestive power to that required by the Pharmacopœia, Sugar of Milk should be employed for this purpose.

A fine, white, or yellowish-white, amorphous powder, or thin, pale yellow or yellowish, transparent or translucent grains or scales, free from any offensive odor, and having a mildly acidulous or slightly saline taste, usually followed by a suggestion of bitterness. It slowly attracts moisture when exposed to the air.

Soluble, or for the most part soluble, in about 100 parts of water, with more or less opalescence; more soluble in water acidulated with hydrochloric acid; insoluble in alcohol, ether, or chloroform.

On heating a solution of Pepsin in acidulated water to 100° C. (212° F.) it becomes milky, or yields a light, flocculent precipitate, and loses all proteolytic power. In a dry state it can bear this temperature without injury.

Pepsin usually has a slightly acid reaction. It may be neutral, but should never be alkaline.

Valuation of Pepsin.—Prepare, first, the following three solutions:

A. To 294 Cc. of water add 6 Cc. of diluted hydrochloric acid.

B. In 100 Cc. of solution A dissolve 0.067 Gm. of the Pepsin to be tested.

C. To 95 Cc. of solution A, brought to a temperature of 40° C. (104° F.), add 5 Cc. of solution B.

The resulting 100 Cc. of liquid will contain 2 Cc. of diluted hydrochloric acid, 0.00335 Gm. of the Pepsin to be tested, and 98 Cc. of water.

Immerse and keep a fresh hen's egg during fifteen minutes in boiling water; then remove it and place it into cold water. When it is cold, separate the white, coagulated albumen, and rub it through a clean sieve having 30 meshes to the linear inch. Reject the first portion passing through the sieve. Weigh off 10 Gm. of the second, cleaner portion, place it in a flask of the capacity of about 200 Cc., then add one-half of solution C, and shake well, so as to distribute the coherent albumen evenly throughout the liquid. Then add the second half of solution C, and shake again, guarding against loss. Place the flask in a water-bath, or thermostat, kept at a temperature of 38° to 40° C. (100.4° to 104° F.), for six hours, and shake it gently every fifteen minutes. At

the expiration of this time the albumen should have disappeared, leaving at most only a few, thin, insoluble flakes. (Trustworthy results, particularly in comparative trials, will be obtained only if the temperature be strictly maintained between the prescribed limits, and if the contents of the flasks be agitated uniformly, and in equal intervals of time.)

The relative proteolytic power of Pepsin stronger or weaker than that described above may be determined by ascertaining, through repeated trials, how much of solution *B* made up to 100 Cc. with solution *A* will be required exactly to dissolve 10 Gm. of coagulated and disintegrated albumen under the conditions given above.

Preparation: Pepsinum Saccharatum.

PEPSINUM SACCHARATUM.

SACCHARATED PEPSIN.

Pepsin, <i>ten grammes</i>	10 Gm.
Sugar of Milk, recently dried, and in No. 30 powder, <i>ninety grammes</i>	90 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Triturate the Pepsin with the Sugar of Milk to a fine, uniform powder.

Keep the product in well-stoppered bottles.

Saccharated Pepsin, when tested by the process given under Pepsin (see *Pepsinum*), with the modification that 0.67 Gm. of it are to be taken in preparing solution *B*, should digest 300 times its own weight of freshly coagulated and disintegrated egg albumen.

PETROLATUM LIQUIDUM.

LIQUID PETROLATUM.

A mixture of hydrocarbons, chiefly of the marsh-gas series, obtained by distilling off the lighter and more volatile portions from petroleum, and purifying the residue when it has the desired consistence.

A colorless, or more or less yellowish, oily, transparent liquid, without odor or taste, or giving off, when heated, a faint odor of petroleum.

Specific gravity: about 0.875 to 0.945 at 15° C. (59° F.).

Insoluble in water; scarcely soluble in cold or hot alcohol, or in cold absolute alcohol; but soluble in boiling absolute alcohol, and readily soluble in ether, chloroform, carbon disulphide, oil of turpentine, benzin, benzol, and fixed or volatile oils.

When heated on platinum, Liquid Petrolatum is completely volatilized, without emitting any acrid vapors.

The alcoholic solution of Liquid Petrolatum is neutral to litmus paper.

If 5 Gm. of Liquid Petrolatum be digested, for half an hour, with 5 Gm. of sodium hydrate and 25 Cc. of water, the aqueous layer separated, and supersaturated with sulphuric acid, no oily substance should separate (absence of *fixed oils or fats of animal or vegetable origin*, or of *resin*).

If 2 volumes of concentrated sulphuric acid be added to 1 volume of Liquid Petrolatum, in a test-tube placed in hot water, and the contents occasionally agitated during fifteen minutes, the acid should not acquire a deeper tint than brown, nor lose its transparency (limit of *readily carbonizable, organic impurities*).

PETROLATUM MOLLE.

SOFT PETROLATUM.

[PETROLATUM, PHARM. 1880. SOFT PETROLEUM OINTMENT.]

A mixture of hydrocarbons, chiefly of the marsh-gas series, obtained by distilling off the lighter and more volatile portions from petroleum, and purifying the residue when it has the desired melting point.

When Petrolatum is prescribed or ordered without further specification, Soft Petrolatum (*Petrolatum Molle*) is to be dispensed.

A fat-like mass, of about the consistence of an ointment, varying from white to yellowish or yellow, more or less fluorescent when yellow, especially after being melted, transparent in thin layers, completely amorphous, and without odor or taste, or giving off, when heated, a faint odor of petroleum.

If a portion of Soft Petrolatum be liquefied, and brought to a temperature of 60° C. (140° F.), it will have a specific gravity of about 0.820 to 0.840.

The melting point of Soft Petrolatum ranges between about 40° and 45° C. (104° and 113° F.).

In other respects Soft Petrolatum has the characteristics of, and should respond to the tests given under, Liquid Petrolatum (see *Petrolatum Liquidum*).

PETROLATUM SPISSUM.

HARD PETROLATUM.

[PETROLATUM, PHARM. 1880. HARD PETROLEUM OINTMENT.]

A mixture of hydrocarbons, chiefly of the marsh-gas series, obtained by distilling off the lighter and more volatile portions from petroleum, and purifying the residue when it has the desired melting point.

A fat-like mass, of about the consistence of a cerate, varying from white to yellowish or yellow, more or less fluorescent when yellow, especially after being melted, transparent in thin layers, completely amorphous, and without odor or taste, or giving off, when heated, a faint odor of petroleum.

If a portion of Hard Petrolatum be liquefied, and brought to a temperature of 60° C. (142° F.), it will have a specific gravity of about 0.820 to 0.850.

The melting point of Hard Petrolatum ranges between about 45° and 51° C. (113° and 125° F.).

In other respects Hard Petrolatum has the characteristics of, and should respond to the tests given under, Liquid Petrolatum (see *Petrolatum Liquidum*).

PHOSPHORUS.

PHOSPHORUS.

$$P = 30.96.$$

Phosphorus should be carefully kept under water, in strong, well-closed vessels, in a secure and moderately cool place, protected from light.

A translucent, nearly colorless solid, of a waxy lustre, having, at ordinary temperatures, about the consistence of beeswax. By long keeping, the surface becomes red, and occasionally black. It has a distinctive and disagreeable odor and taste (*but should not be tasted, except in a state of great dilution*). When exposed to the air, it emits white fumes, which are luminous in the dark, and have an odor somewhat resembling that of garlic. On longer exposure to air, it takes fire spontaneously.

Specific gravity: 1.830 at 10° C. (50° F.). Melting point: 44° C. (111.2° F.).

Phosphorus is insoluble or nearly so in water, to which, however, it imparts its characteristic, disagreeable odor and taste. Soluble in 350 parts of absolute alcohol at 15° C. (59° F.), in 240 parts of boiling absolute alcohol, in 80 parts of absolute ether, in about 50 parts of any fatty oil, and very soluble in chloroform, or in carbon disulphide, the latter yielding a solution which must be handled with the greatest care to prevent danger from fire.

To test for *arsenic* and *sulphur* proceed as follows: Add 3 Gm. of Phosphorus to 15 Cc. of nitric acid diluted with 15 Cc. of distilled water in a flask having the capacity of 50 Cc., and digest the mixture at a gentle heat on a water-bath, until the Phosphorus is dissolved. Transfer the solution to a capsule, and evaporate it until no more nitrous vapors are given off, and then dilute the solution to 30 Cc. with distilled water. Heat 20 Cc. of the diluted solution to about 70° C. (158° F.) for half an hour, passing hydrogen sulphide through it during the half-hour's heating, and then until the liquid has become cold. If the liquid be now allowed to stand at rest during twenty-four hours, not more than a very small quantity of lemon-yellow precipitate should be visible (limit of *arsenic*).

On adding barium chloride T.S. to the remainder of the liquid, not more than a slight opalescence should be produced (limit of *sulphur*).

Preparations: Oleum Phosphoratum. Pilulæ Phosphori. Spiritus Phosphori.

PHYSOSTIGMA.

PHYSOSTIGMA.

[CALABAR BEAN.]

The seed of *Physostigma venenosum* Balfour (nat. ord. *Leguminosæ*).

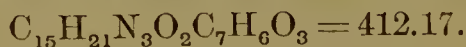
About 25 to 30 Mm. long, 15 to 20 Mm. broad, and 10 to 15 Mm. thick; oblong, and somewhat reniform; testa granular, chocolate-brown, with a broad, black groove extending over the entire length of the convex edge; embryo with a short, curved radicle, and two large, white, concavo-convex cotyledons; inodorous; taste bean-like.

On moistening the embryo with potassium hydrate T.S., it becomes pale yellow.

Preparations: Extractum Physostigmatis. Tinctura Physostigmatis.

PHYSOSTIGMINÆ SALICYLAS.

PHYSOSTIGMINE SALICYLATE.



[ESERINE SALICYLATE.]

The salicylate of an alkaloid obtained from *Physostigma*.

It should be kept in small, dark amber-colored and well-stoppered vials.

Colorless or faintly yellowish, shining, acicular, or short, columnar crystals, odorless, and having a bitter taste. It acquires a reddish tint when long exposed to light and air.

Soluble, at 15° C. (59° F.), in 150 parts of water, and in 12 parts of alcohol; in 30 parts of boiling water, and very soluble in boiling alcohol.

When heated to about 179° C. (354.2° F.), the salt melts. Upon ignition, it is consumed, leaving no residue.

The salt usually has a faintly acid reaction on litmus paper.

On adding a small portion of the salt to colorless, concentrated sulphuric acid, the latter assumes a tint not deeper than yellow.

If a minute portion of the salt be added to a few Cc. of ammonia water, in a small capsule, the liquid will acquire a yellowish-red color. On evaporating the liquid on a water-bath, a blue residue will be left which yields, with alcohol, a blue solution becoming violet-red upon supersaturation with acetic acid, and exhibiting a strong, reddish fluorescence.

The aqueous solution of the salt, when mixed with ferric chloride T.S., assumes a deep violet color.

PHYSOSTIGMINÆ SULPHAS.

PHYSOSTIGMINE SULPHATE.



[ESERINE SULPHATE.]

The sulphate of an alkaloid obtained from *Physostigma*.

It should be kept in small, dark amber-colored and well-stoppered vials.

A white or yellowish-white, micro-crystalline powder; odorless, and having a bitter taste. It is very deliquescent when exposed to moist air, and gradually turns reddish by exposure to air and light.

Very soluble in water and in alcohol, at 15° C. (59° F.), and still more so at the boiling temperature of these liquids.

At 105° C. (221° F.), the salt melts, and upon ignition it is consumed, leaving no residue.

The salt is neutral to litmus paper.

On adding a small portion of the salt to colorless, concentrated sulphuric acid, the latter should not assume a tint deeper than yellow.

If a minute portion of the salt be added to a few Cc. of ammonia water in a small capsule, the liquid will acquire a yellowish-red color. On evaporating this liquid on a water-bath, a blue or bluish-gray residue will be left which yields, with alcohol, a blue solution becoming violet-red upon supersaturation with acetic acid, and exhibiting a strong reddish fluorescence.

The aqueous solution of the salt yields, with barium chloride T.S., a white precipitate, insoluble in hydrochloric acid.

PHYTOLACCÆ FRUCTUS.

PHYTOLACCA FRUIT.

[PHYTOLACCÆ BACCA, PHARM. 1880. POKE BERRY.]

The fruit of *Phytolacca decandra* Linné (nat. ord. *Phytolaccaceæ*).

A depressed-globular, dark purple, compound berry, about 8 Mm. in diameter, composed of ten carpels, each containing one lenticular, black seed; juice purplish-red; inodorous; taste sweet, slightly acrid.

PHYTOLACCÆ RADIX.**PHYTOLACCA ROOT.**

[POKE ROOT.]

The root of *Phytolacca decandra* Linné (nat. ord. *Phytolaccaceæ*).

Large, conical, branched and fleshy; mostly in transverse or longitudinal slices, wrinkled, grayish, hard; fracture fibrous, the wood-bundles in several distinct, concentric circles; inodorous; taste sweetish and acrid.

Preparation: Extractum Phytolaccae Radicis Fluidum.

PICROTOXINUM.**PICROTOXIN.**

A neutral principle obtained from the seed of *Anamirta paniculata* Colebrooke (nat. ord. *Menispermaceæ*).

Colorless, flexible, shining, prismatic crystals, or a micro-crystalline powder, odorless, and having a very bitter taste; permanent in the air.

Soluble, at 15° C. (59° F.), in 240 parts of water, and in 9 parts of alcohol; in 25 parts of boiling water, and in 3 parts of boiling alcohol; also soluble in solutions of the alkalies, and in acids. Very slightly soluble in ether or chloroform.

Picrotoxin is neutral to litmus paper.

When heated to 200° C. (392° F.), Picrotoxin melts, forming a yellow liquid, and upon ignition it is consumed, leaving no residue.

Concentrated sulphuric acid dissolves Picrotoxin with a golden-yellow color, very gradually changing to reddish-brown, and showing a brown fluorescence.

On mixing about 0.2 Gm. of powdered sodium nitrate with 3 or 4 drops of sulphuric acid, in a small, flat-bottomed capsule, sprinkling a minute quantity of Picrotoxin over it, and then adding, from a pipette, concentrated solution (1 in 4) of sodium hydrate, drop by drop, until it is in excess, the particles of Picrotoxin will acquire a brick-red to deep red color which fades after some hours.

On diluting 2 Cc. of alkaline cupric tartrate V.S. with 10 Cc. of water, and adding a small portion of Picrotoxin, red cuprous oxide will be separated within half an hour at ordinary temperatures, and much more rapidly upon the application of heat.

The aqueous solution of Picrotoxin should remain unaffected by mercuric or platinic chloride T.S., tannic acid T.S., mercuric potassium iodide T.S., or other reagents for alkaloids (absence of *alkaloids*).

PILOCARPINÆ HYDROCHLORAS.**PILOCARPINE HYDROCHLORATE.**

The hydrochlorate of an alkaloid obtained from *Pilocarpus*. It should be kept in small, well-stoppered vials.

Small, white crystals, odorless, and having a faintly bitter taste; deliquescent on exposure to damp air.

Very soluble in water and in alcohol; almost insoluble in ether or chloroform.

When heated to 197° C. (386.6° F.), the salt melts, and upon ignition it is consumed, leaving no residue.

The aqueous solution (1 in 100) of the salt is neutral, or has a faintly acid reaction upon litmus paper.

Concentrated sulphuric acid dissolves the salt to a colorless liquid, with evolution of hydrochloric acid vapor. If a small fragment of potassium dichromate be added to a few drops of this solution, on a white porcelain surface, the dichromate will gradually dissolve with a vivid dark green color.

Fuming nitric acid dissolves the salt with a faintly greenish tint.

The aqueous solution (1 in 100) of the salt is precipitated by iodine T.S., bromine water, mercuric chloride T.S., and most other reagents for alkaloids.

If the aqueous solution be slightly acidulated, the subsequent addition of ammonia water will produce no precipitate.

Sodium hydrate T.S. produces a precipitate only in a concentrated solution of the salt.

The aqueous solution yields with silver nitrate T.S. a white precipitate insoluble in nitric acid.

PILOCARPUS.

PILOCARPUS.

[JABORANDI.]

The leaflets of *Pilocarpus Selloanus* Engler (Rio Janeiro Jaborandi), and of *Pilocarpus Jaborandi* Holmes (Pernambuco Jaborandi), (nat. ord. *Rutaceæ*).

About 10 to 15 Cm. long, and 4 to 6 Cm. broad, short-stalked, oval or ovate-oblong, entire and slightly revolute at the margin, obtuse and emarginate, unequal at the base; dull green, coriaceous, pellucid-punctate, mostly smooth; when bruised, slightly aromatic; taste somewhat bitter and pungent.

Preparation: Extractum Pilocarpi Fluidum.

PILULÆ ALOES.

PILLS OF ALOES.

Purified Aloes, in fine powder, <i>thirteen grammes</i>	13 Gm.
Soap, in fine powder, <i>thirteen grammes</i>	13 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one hundred pills*.... 100

Beat the powders together with Water, so as to form a mass, and divide it into *one hundred (100) pills*.

PILULÆ ALOES ET ASAFÆTIDÆ.

PILLS OF ALOES AND ASAFETIDA.

Purified Aloes, in fine powder, <i>nine grammes</i>	9 Gm.
Asafetida, <i>nine grammes</i>	9 Gm.
Soap, in fine powder, <i>nine grammes</i>	9 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one hundred pills*.... 100

Beat the solids together with Water, so as to form a mass, and divide it into *one hundred (100) pills*.

PILULÆ ALOES ET FERRI.

PILLS OF ALOES AND IRON.

Purified Aloes, in fine powder, <i>seven grammes</i>	7 Gm.
Dried Ferrous Sulphate, <i>seven grammes</i>	7 Gm.
Aromatic Powder, <i>seven grammes</i>	7 Gm.
Confection of Rose, <i>a sufficient quantity</i> ,	

To make *one hundred pills*. . . . 100

Beat the powders together with Confection of Rose, so as to form a mass, and divide it into *one hundred (100) pills*.

PILULÆ ALOES ET MASTICHES.

PILLS OF ALOES AND MASTIC.

Purified Aloes, in fine powder, <i>thirteen grammes</i>	13 Gm.
Mastic, in fine powder, <i>four grammes</i>	4 Gm.
Red Rose, in fine powder, <i>three grammes</i>	3 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one hundred pills*. . . . 100

Beat the powders together with Water, so as to form a mass, and divide it into *one hundred (100) pills*.

PILULÆ ALOES ET MYRRHÆ.

PILLS OF ALOES AND MYRRH.

Purified Aloes, in fine powder, <i>thirteen grammes</i>	13 Gm.
Myrrh, in fine powder, <i>six grammes</i>	6 Gm.
Aromatic Powder, <i>four grammes</i>	4 Gm.
Syrup, <i>a sufficient quantity</i> ,	

To make *one hundred pills*. . . . 100

Beat the powders together with Syrup, so as to form a mass, and divide it into *one hundred (100) pills*.

PILULÆ ANTIMONII COMPOSITÆ.

COMPOUND PILLS OF ANTIMONY.

[PLUMMER'S PILLS.]

Sulphurated Antimony, <i>four grammes</i>	4 Gm.
Mild Mercurous Chloride, <i>four grammes</i>	4 Gm.
Guaiac, in fine powder, <i>eight grammes</i>	8 Gm.
Castor Oil, <i>a sufficient quantity</i> ,	

To make *one hundred pills*. . . . 100

Beat the powders together with Castor Oil, added a few drops at a time, so as to form a mass, and divide it into *one hundred* (100) *pills*.

PILULÆ ASAFŒTIDÆ.

PILLS OF ASAFETIDA.

Asafetida, <i>twenty grammes</i>	20 Gm.
Soap, in fine powder, <i>six grammes</i>	6 Gm.
Water, <i>a sufficient quantity</i> ,	
To make <i>one hundred pills</i>	100

Beat the solids together with Water, so as to form a mass, and divide it into *one hundred* (100) *pills*.

PILULÆ CATHARTICÆ COMPOSITÆ.

COMPOUND CATHARTIC PILLS.

Compound Extract of Colocynth, <i>eighty grammes</i>	80 Gm.
Mild Mercurous Chloride, <i>sixty grammes</i>	60 Gm.
Extract of Jalap, <i>thirty grammes</i>	30 Gm.
Gamboge, in fine powder, <i>fifteen grammes</i>	15 Gm.
Water, <i>a sufficient quantity</i> ,	
To make <i>one thousand pills</i>	1000

Mix the powders intimately ; then gradually incorporate them with the Extract of Jalap and a sufficient quantity of Water to form a mass, to be divided into *one thousand* (1000) *pills*.

PILULÆ CATHARTICÆ VEGETABILES.

VEGETABLE CATHARTIC PILLS.

Compound Extract of Colocynth, <i>sixty grammes</i>	60 Gm.
Extract of Hyoscyamus, <i>thirty grammes</i>	30 Gm.
Extract of Jalap, <i>thirty grammes</i>	30 Gm.
Extract of Leptandra, <i>fifteen grammes</i>	15 Gm.
Resin of Podophyllum, <i>fifteen grammes</i>	15 Gm.
Oil of Peppermint, <i>eight cubic centimeters</i>	8 Cc.
Water, <i>a sufficient quantity</i> ,	
To make <i>one thousand pills</i>	1000

Mix the Compound Extract of Colocynth intimately with the Resin of Podophyllum and incorporate the Oil of Peppermint. Rub the Extracts of Hyoscyamus, Jalap, and Leptandra with enough Water to render them plastic, then beat them together with the mixture first

prepared, using a sufficient quantity of Water to form a mass, to be divided into *one thousand* (1000) *pills*.

PILULÆ FERRI CARBONATIS.

PILLS OF FERROUS CARBONATE.

[FERRUGINOUS PILLS. CHALYBEATE PILLS. BLAUD'S PILLS.]

Ferrous Sulphate, in clear crystals, <i>sixteen grammes</i>	16 Gm.
Potassium Carbonate, <i>eight grammes</i>	8 Gm.
Sugar, <i>four grammes</i>	4 Gm.
Tragacanth, in fine powder, <i>one gramme</i>	1 Gm.
Althæa, in No. 60 powder, <i>one gramme</i>	1 Gm.
Glycerin,	
Water, each, <i>a sufficient quantity</i> ,	

To make *one hundred pills*.... 100

Rub the Potassium Carbonate, in a mortar, with a sufficient quantity (about *ten* (10) *drops* each) of Glycerin and Water, then add the Ferrous Sulphate and Sugar, previously triturated together to a uniform powder, and beat the mass thoroughly, until it assumes a greenish color. When the reaction appears to have terminated, incorporate the Tragacanth and Althæa, and, if necessary, add a little more Water, so as to obtain a mass of a pilular consistence. Divide this into *one hundred* (100) *pills*.

These pills should be freshly prepared, when wanted.

PILULÆ FERRI IODIDI.

PILLS OF FERROUS IODIDE.

Reduced Iron, <i>four grammes</i>	4 Gm.
Iodine, <i>five grammes</i>	5 Gm.
Glycyrrhiza, in No. 60 powder, <i>four grammes</i>	4 Gm.
Sugar, in fine powder, <i>four grammes</i>	4 Gm.
Extract of Glycyrrhiza, in fine powder, <i>one gramme</i>	1 Gm.
Acacia, in fine powder, <i>one gramme</i>	1 Gm.
Water,	
Balsam of Tolu,	
Ether, each, <i>a sufficient quantity</i> ,	

To make *one hundred pills*.... 100

To the Reduced Iron, contained in a small mortar, add *six* (6) *cubic centimeters* of Water, and then, gradually, the Iodine, constantly triturating, until the mixture ceases to have a reddish tint. Then add

the remaining powders, previously well mixed together, and mix the whole thoroughly. Transfer the mass to a porcelain capsule, and evaporate the excess of moisture, on a water-bath, with constant stirring, until the mass has acquired a pilular consistence. Then divide it into *one hundred* (100) *pills*.

Dissolve *ten* (10) *grammes*, of Balsam of Tolu in *fifteen* (15) *cubic centimeters* of Ether, shake the pills with a sufficient quantity of this solution until they are uniformly coated, and put them on a plate to dry, occasionally rolling them about until the drying is completed.

Keep the pills in a well-stoppered bottle.

Pills of Ferrous Iodide should be devoid of the smell of iodine.

If a few of the pills be triturated with water, the filtrate should not assume more than a light blue tint on the addition of starch T.S. (absence of more than traces of *free iodine*).

PILULÆ OPII.

PILLS OF OPIUM.

Powdered Opium, <i>six and one-half grammes</i>	6.5 Gm.
Soap, in fine powder, <i>two grammes</i>	2.0 Gm.
Water, <i>a sufficient quantity</i> ,	

To make <i>one hundred pills</i>	100
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Beat the powders together with Water, so as to form a mass, and divide it into *one hundred* (100) *pills*.

PILULÆ PHOSPHORI.

PILLS OF PHOSPHORUS.

Phosphorus, <i>six centigrammes</i>	0.06 Gm.
Althæa, in No. 60 powder, <i>six grammes</i>	6.00 Gm.
Acacia, in fine powder, <i>six grammes</i>	6.00 Gm.
Chloroform,	
Glycerin,	
Water,	
Balsam of Tolu,	
Ether, each, <i>a sufficient quantity</i> ,	

To make <i>one hundred pills</i>	100
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Dissolve the Phosphorus, in a test-tube, in *five* (5) *cubic centimeters* of Chloroform, with the aid of a very gentle heat, replacing from time to time any of the Chloroform which may be lost by evaporation. Mix the Althæa and Acacia in a mortar, next add the solution of Phosphorus, then immediately afterwards a sufficient quantity (about *four*

(4) *cubic centimeters*) of a mixture of *two* (2) *volumes* of Glycerin and *one* (1) *volume* of Water, and quickly form a mass, to be divided into *one hundred* (100) *pills*.

Dissolve *ten* (10) *grammes* of Balsam of Tolu in *fifteen* (15) *cubic centimeters* of Ether, shake the pills with a sufficient quantity of this solution until they are uniformly coated, and put them on a plate to dry, occasionally rolling them about until the drying is completed.

Keep the pills in a well-stoppered bottle.

PILULÆ RHEI.

PILLS OF RHUBARB.

Rhubarb, in No. 60 powder, <i>twenty grammes</i>	20 Gm.
Soap, in fine powder, <i>six grammes</i>	6 Gm.
Water, <i>a sufficient quantity</i> ,	
To make <i>one hundred pills</i>	100

Beat the powders together with Water, so as to form a mass, to be divided into *one hundred* (100) *pills*.

PILULÆ RHEI COMPOSITÆ.

COMPOUND PILLS OF RHUBARB.

Rhubarb, in No. 60 powder, <i>thirteen grammes</i>	13 Gm.
Purified Aloes, in fine powder, <i>ten grammes</i>	10 Gm.
Myrrh, in fine powder, <i>six grammes</i>	6 Gm.
Oil of Peppermint, <i>one-half cubic centimeter</i>	0.5 Cc.
Water, <i>a sufficient quantity</i> ,	
To make <i>one hundred pills</i>	100

Mix the Oil of Peppermint with the powders, then beat the mixture with Water so as to form a mass, to be divided into *one hundred* (100) *pills*.

PIMENTA.

PIMENTA.

[ALLSPICE.]

The nearly ripe fruit of *Pimenta officinalis* Lindley (nat. ord. *Myrtaceæ*).

About 5 Mm. in diameter, nearly globular, crowned with the short, four-parted calyx or its remnants, and a short style; brownish or brownish-gray, granular and glandular, two-celled; each cell containing one brown, plano-convex, roundish-reniform seed; odor and taste pungently aromatic, clove-like.

PIPER.

PEPPER.

[BLACK PEPPER.]

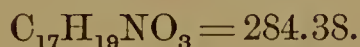
The unripe fruit of *Piper nigrum* Linné (nat. ord. *Piperaceæ*).

Globular, about 4 Mm. in diameter, reticulately wrinkled, brownish-black or grayish black, internally lighter, hollow, with an undeveloped embryo; odor aromatic; taste pungently spicy.

Preparation: Oleoresina Piperis.

PIPERINUM.

PIPERIN.



A neutral principle obtained from pepper, and obtainable also from other plants of the natural order *Piperaceæ*.

Colorless, or pale yellowish, shining, prismatic crystals, odorless, and almost tasteless when first put in the mouth, but on prolonged contact producing a sharp and biting sensation. Permanent in the air.

Almost insoluble in water; soluble in 30 parts of alcohol at 15° C. (59° F.), and in 1 part of boiling alcohol; very soluble in hot acetic acid; only slightly soluble in ether.

When heated to 130° C. (266° F.), Piperin melts; upon ignition it emits alkaline vapors, and is consumed, leaving no residue.

The alcoholic solution of Piperin is neutral to litmus paper.

Concentrated sulphuric acid dissolves Piperin with a dark blood-red color, which disappears on dilution with water.

When treated with nitric acid, Piperin turns rapidly first orange and then red, and the acid acquires a yellow color, deepening to reddish as the crystals dissolve. On adding to this solution an excess of potassium hydrate T.S., the color is at first yellow, but upon boiling it becomes blood-red.

PIX BURGUNDICA.

BURGUNDY PITCH.

The prepared, resinous exudation of *Abies excelsa* Poiret (nat. ord. *Coniferæ*).

Hard, yet gradually taking the form of the vessel in which it is kept; brittle, with a shining, conchoidal fracture, opaque or translucent, reddish-brown or yellowish-brown, odor agreeably terebinthinate; taste aromatic, sweetish, not bitter.

It is almost entirely soluble in glacial acetic acid, or in boiling alcohol, and partly soluble in cold alcohol.

Preparations: Emplastrum Picis Burgundicæ. Emplastrum Picis Cantharidatum.

PIX LIQUIDA.

TAR.

An empyreumatic oleoresin obtained by the destructive distillation of the wood of *Pinus palustris* Miller, and of other species of *Pinus* (nat. ord. *Coniferæ*).

Thick, viscid, semi-fluid, blackish-brown, heavier than water, transparent in thin layers, becoming granular and opaque with age; odor empyreumatic, terebinthinate; taste sharp, empyreumatic.

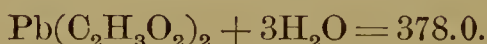
Tar is slightly soluble in water, soluble in alcohol, fixed or volatile oils, and solution of potassium or sodium hydrate.

Water agitated with Tar acquires a pale yellowish-brown color and an acid reaction, yields with ferric chloride T.S. a transient green color, and is colored brownish-red by an equal volume of calcium hydrate T.S.

Preparations: Syrupus Picis Liquidæ. Unguentum Picis Liquidæ.

PLUMBI ACETAS.

LEAD ACETATE.



[SUGAR OF LEAD.]

Lead Acetate should be kept in well-stoppered bottles.

Colorless, shining, transparent, monoclinic prisms or plates, or heavy, white, crystalline masses, or granular crystals, having a faintly acetous odor, and a sweetish, astringent, afterwards metallic taste. Efflorescent, and absorbing carbon dioxide, on exposure to the air.

Soluble, at 15° C. (59° F.), in 2.3 parts of water, and in 21 parts of alcohol; in 0.5 part of boiling water, and in 1 part of boiling alcohol.

When heated to 40° C. (104° F.), the salt loses its water of crystallization (14.25 per cent.). It fuses at 200° C. (392° F.) with the loss of acetic acid, and when strongly heated it is completely decomposed, with the evolution of carbon dioxide and acetone, leaving a residue of finely divided metallic lead mixed with oxide and carbonate.

On heating the salt with sulphuric acid, vapors of acetic acid are evolved.

The aqueous solution of the salt has a slightly acid reaction, and yields a black precipitate with hydrogen sulphide T.S., a yellow one with potassium iodide T.S., and a white one with diluted sulphuric acid.

A 10-per-cent. solution of the salt, prepared with water which has recently been boiled, should be clear, or only slightly opalescent (limit of *carbonate*), and should yield, with potassium ferrocyanide T.S., a pure white precipitate (absence of *iron* or *copper*).

If to the aqueous solution hydrochloric acid be added until no further precipitate is produced, and the remainder of the lead removed from the filtrate by hydrogen sulphide, a portion of the new filtrate should not be affected by the addition of a slight excess of ammonia water (absence of *zinc* or *iron*).

If another portion of the last filtrate be evaporated to dryness, it should leave no residue (absence of salts of the *alkalies* or of *zinc*).

Preparation: Liquor Plumbi Subacetatis.

PLUMBI CARBONAS.**LEAD CARBONATE.**

[WHITE LEAD.]

Lead Carbonate should be kept in well-closed vessels.

A heavy, white, opaque powder, or a pulverulent mass, without odor or taste. Permanent in the air.

Insoluble in water or alcohol, but soluble in acetic or diluted nitric acid, with effervescence.

When strongly heated, the salt turns yellow without charring, and, if heated in contact with charcoal, it is reduced to metallic lead.

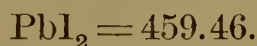
If 2 Gm. of the salt be dissolved in a mixture of 2 Cc. of nitric acid and 10 Cc. of water, it should not leave more than 0.02 Gm. of residue (limit of *insoluble foreign salts*).

This solution yields a black precipitate with hydrogen sulphide T.S., a yellow one with potassium iodide T.S., and a white one with diluted sulphuric acid.

On completely precipitating the solution with hydrogen sulphide, the filtrate should not leave more than a trifling residue on evaporation (limit of *salts of the alkalis, alkaline earths, or of zinc*).

If 1 Gm. of the salt be strongly ignited, in a porcelain crucible, it should leave a residue of lead oxide weighing not less than 0.85 Gm.

Preparation: Unguentum Plumbi Carbonatis.

PLUMBI IODIDUM.**LEAD IODIDE.**

Lead Iodide should be kept in well-stoppered bottles, protected from light.

A heavy, bright yellow powder, without odor or taste. Permanent in the air.

Soluble in about 2000 parts of water at 15° C. (59° F.), and in about 200 parts of boiling water, separating from the latter solution in brilliant, golden-yellow spangles or crystalline laminae. Very slightly soluble in alcohol, but soluble, without color, in solutions of the fixed alkalis, in concentrated solutions of the acetates of the alkalis, of potassium iodide, and of sodium hyposulphite, and in a hot solution of ammonium chloride.

When moderately heated, the salt fuses to a thick, reddish-brown liquid, which congeals, on cooling, to a yellow, crystalline mass. At a higher temperature it is decomposed, with the evolution of violet vapors of iodine, leaving a lemon-yellow residue of lead oxyiodide.

If 1 Gm. of the salt be triturated with 2 Gm. of ammonium chloride and 2 Cc. of water, a nearly white mixture will result. If this be transferred to a test-tube, and heated in a water-bath for a few minutes, a clear and almost colorless solution should be formed (absence of *chromate* and of *other insoluble foreign salts*). On cooling this solution, a solid mass of nearly colorless, fine, silky crystals will be produced, and on adding water or diluted sulphuric acid to this mass, yellow lead iodide will be separated.

If 1 Gm. of the salt be boiled for a few minutes with 20 Cc. of water, the mixture then cooled and filtered, the lead removed from the filtrate by hydrogen

sulphide, and the new filtrate somewhat concentrated by evaporation, a portion of this liquid, when mixed with a little sulphuric acid, and tinted with a drop of indigo T.S., should not become decolorized on heating (absence of *nitrate*).

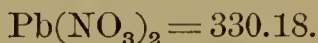
If another portion of the liquid be carefully neutralized with ammonia water, it should not become colored red by a drop of ferric chloride T.S. (absence of *acetate*).

If the remainder of the filtrate be evaporated to dryness, it should leave no residue (absence of *soluble foreign salts*).

Preparation: Unguentum Plumbi Iodidi.

PLUMBI NITRAS.

LEAD NITRATE.



Colorless, transparent, octohedral crystals, when obtained by the spontaneous evaporation of cold solutions, or white, nearly opaque crystals, when formed by the cooling of hot solutions; without odor, and having a sweetish, astringent, afterwards metallic taste. Permanent in the air.

Soluble in 2 parts of water at 15° C. (59° F.), and in 0.75 part of boiling water; almost insoluble in alcohol.

When strongly heated, the salt decrepitates, emits nitrous vapors, and finally leaves a residue of lead oxide.

The aqueous solution has an acid reaction, and yields a black precipitate with hydrogen sulphide T.S., a yellow one with potassium iodide T.S., and a white one with diluted sulphuric acid.

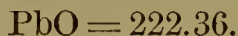
A 10-per-cent. aqueous solution of the salt should give, with potassium ferrocyanide T.S., a pure white precipitate (absence of *iron* or *copper*).

If hydrochloric acid be added to the aqueous solution until no further precipitate is produced, and the remainder of the lead be removed from the filtrate by hydrogen sulphide, a portion of the new filtrate should not be affected by the addition of a slight excess of ammonia water (absence of *zinc* or *iron*).

If another portion be evaporated to dryness, it should leave no residue (absence of *salts of the alkalis*, or of *zinc*).

PLUMBI OXIDUM.

LEAD OXIDE.



[LITHARGE.]

Lead Oxide should be kept in well-closed vessels.

A heavy, yellowish or reddish-yellow powder, or minute scales, without odor or taste. On exposure to the air it slowly absorbs moisture and carbon dioxide.

Almost insoluble in water, to which it, however, imparts a faintly alkaline reaction; insoluble in alcohol; but soluble in acetic or diluted nitric acid, and in warm solutions of the fixed alkalies.

When heated, the Oxide assumes a brownish-red color, becoming yellow again on cooling. It fuses at a red heat. When heated in contact with charcoal, it is reduced to metallic lead.

Lead Oxide should be soluble in diluted nitric acid with but little effervescence (limit of *carbonate*), and without the development of the odor of *nitrous acid*, leaving not more than a trifling residue (absence of *silicate*, *barium sulphate*, etc.).

The solution, which should be colorless, yields with hydrogen sulphide T.S. a black precipitate, with potassium iodide T.S. a yellow one, and with diluted sulphuric acid a white precipitate, the latter being soluble in a strong solution of sodium hydrate.

If from the solution in diluted nitric acid the lead be precipitated by sulphuric acid, the filtrate, after the addition of an excess of ammonia water, should not assume more than a slight bluish tint (limit of *copper*), nor yield more than traces of a reddish-yellow precipitate (limit of *iron*).

If 5 Gm. of the Oxide contained in a small flask be shaken with 5 Cc. of water, then 20 Cc. of acetic acid added, and the mixture boiled for a few minutes and filtered, the insoluble residue, when well washed and dried, should not weigh more than 0.075 Gm. (absence of more than 1.5 per cent. of *insoluble impurities*).

When strongly heated, in a porcelain crucible, the Oxide should not lose more than 2 per cent. of its weight (limit of *carbonate* and of *moisture*).

PODOPHYLLUM.

PODOPHYLLUM.

[MAY APPLE.]

The rhizome and roots of *Podophyllum peltatum* Linné (nat. ord. *Berberidæ*).

Of horizontal growth, consisting of joints about 5 Cm. long, flattish cylindrical, about 5 Mm. thick, but somewhat enlarged at the end, which has a circular scar on the upper side, a tuft of about ten, nearly simple, fragile roots on the lower side, and is sometimes branched laterally; smooth or somewhat wrinkled, orange-brown, internally white and mealy, with a circle of small wood-bundles; pith large; nearly inodorous; taste sweetish, somewhat bitter and acid.

Preparations: Extractum Podophylli. Extractum Podophylli Fluidum. Resina Podophylli.

POTASSA.

POTASSA.

KOH = 55.99.

[POTASSIUM HYDRATE. POTASSIUM HYDROXIDE. CAUSTIC POTASH.]

Potassa should be kept in well-stoppered bottles made of hard glass.

Dry, white, translucent pencils, or fused masses, hard and brittle, showing a crystalline fracture; odorless, or having a faint odor of lye, and of a very acrid and caustic taste. Great caution is necessary in tasting and handling it, as it rapidly destroys organic tissues. Exposed to the air, it rapidly absorbs carbon dioxide and moisture, and deliquesces.

Soluble, at 15° C. (59° F.), in about 0.5 part of water, and in 2 parts of alcohol; very soluble in boiling water, and in boiling alcohol; slightly soluble in ether.

When heated to about 530° C. (986° F.), Potassa melts to a clear, oily liquid, and at a bright red heat it is volatilized unchanged. When introduced into a non-luminous flame, it imparts to it a violet color.

A solution of Potassa, even when greatly diluted, gives an intensely alkaline reaction with litmus paper.

The aqueous solution (1 in 20) should be perfectly clear and colorless (absence of *organic matter*).

After acidulation with hydrochloric acid it yields bright yellow precipitates with platinic chloride T.S., and with sodium cobaltic nitrite T.S.

A concentrated, aqueous solution (1 in 10), when dropped into tartaric acid T.S., produces a white, crystalline precipitate, which redissolves when the Potassa is added in excess.

If 1 Gm. of Potassa be dissolved in 10 Cc. of water, and slightly supersaturated with acetic acid, 10 Cc. of the solution should not be colored or rendered turbid by the addition of an equal volume of hydrogen sulphide T.S. (absence of *arsenic*, *lead*, etc.), nor by the subsequent addition of ammonia water in slight excess (absence of *iron*, *aluminum*, etc.).

The remainder of the acidulated solution should not be rendered turbid by ammonium oxalate T.S. (absence of *calcium*).

If a solution of 1.5 Gm. of Potassa in 10 Cc. of water be slightly supersaturated with nitric acid, then 0.5 Cc. of decinormal silver nitrate V.S. added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the addition of more silver nitrate V.S. (limit of *chloride*).

If to a solution of 3.5 Gm. of Potassa in 10 Cc. of water, strongly supersaturated with hydrochloric acid, 0.1 Cc. of barium chloride T.S. be added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of barium chloride T.S. (limit of *sulphate*).

If 1 Gm. of Potassa be dissolved in 2 Cc. of water, and added to 10 Cc. of alcohol, not more than a slight, colorless precipitate should occur within ten minutes (limit of *silicate*).

After boiling this alcoholic solution with 5 Cc. of calcium hydrate T.S. and filtering, not the slightest effervescence should take place on adding the filtrate to an excess of diluted hydrochloric acid (limit of *carbonate*).

If 0.2 Gm. of Potassa be dissolved in 2 Cc. of water, and carefully mixed with 4 Cc. of pure sulphuric acid and 2 drops of indigo T.S., the blue color should not be discharged (limit of *nitrate*).

To test for *soda*, dissolve 0.56 Gm. of Potassa in 5 Cc. of water, add a few drops of phenolphthalein T.S., and then, from a burette, enough tartaric acid T.S. (3 Gm. in 20 Cc.) to accurately neutralize the solution. Next add another volume of the tartaric acid T.S. equal to that first used, and then enough absolute alcohol to completely precipitate the potassium bitartrate formed. Separate the precipitate by filtration and wash it with a little alcohol. The filtrate should not require more than 0.2 Cc. of normal potassium hydrate V.S. to restore the red color (absence of more than 1.5 per cent. of *soda*).

To neutralize 0.56 Gm. of Potassa should require not less than 9 Cc. of normal sulphuric acid (each Cc. corresponding to 10 per cent. of pure potassium hydrate), phenolphthalein being used as indicator.

Preparations: Liquor Potassæ. Potassa cum Calce.

POTASSA CUM CALCE.

POTASSA WITH LIME.

Potassa, five hundred grammes	500 Gm.
Lime, five hundred grammes	500 Gm.

To make one thousand grammes. . . . 1000 Gm.

Rub them together, in a warm iron mortar, so as to form a powder, and keep it in a well-stoppered bottle.

A grayish-white powder, deliquescent, having a strongly alkaline reaction, and responding to the tests for calcium and potassium. It should be soluble in diluted hydrochloric acid without leaving more than a small residue.

POTASSA SULPHURATA.

SULPHURATED POTASSA.

[LIVER OF SULPHUR.]

Sublimed Sulphur, *one hundred grammes* 100 Gm.

Potassium Carbonate, dried, *two hundred grammes* 200 Gm.

Mix the powdered and dried Potassium Carbonate thoroughly with the Sublimed Sulphur, and gradually heat the mixture, in a covered crucible, which should be only about half filled with it, until the mass ceases to foam and is in a state of perfect fusion. Then pour the fused mass on a cold marble slab, and, after it has cooled, break it into pieces, and keep it in a well-stoppered bottle.

When freshly prepared, Sulphurated Potassa forms irregular pieces of a liver-brown color, which, by exposure to the air, gradually absorb moisture, oxygen, and carbon dioxide, and change to a greenish-yellow and finally to a gray mass containing potassium carbonate, hyposulphite, and sulphate. The compound has a faint odor of hydrogen sulphide, and a bitter, alkaline taste.

Soluble in 2 parts of water at 15° C. (59° F.), with the exception of a small residue. Alcohol dissolves only the potassium sulphide, leaving the other constituents (hyposulphite and sulphate) undissolved.

The aqueous solution (1 in 10) is of an orange-yellow color, is strongly alkaline to litmus paper, and gives off the odor of hydrogen sulphide.

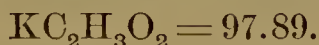
On adding to it acetic acid in slight excess, an abundance of hydrogen sulphide is evolved, while sulphur is precipitated.

In this liquid, after filtration, sodium bitartrate T.S. produces an abundant, white, crystalline precipitate.

On triturating 1 Gm. of Sulphurated Potassa with 1 Gm. of crystallized copper sulphate and 10 Cc. of water, and filtering, the filtrate should remain unaffected by hydrogen sulphide T.S., corresponding to at least 12.85 per cent. of sulphur combined with potassium to form sulphide.

POTASSII ACETAS.

POTASSIUM ACETATE.



Potassium Acetate should be kept in well-stoppered bottles.

A white powder, or crystalline masses of a satiny lustre, odorless, and having a warming, saline taste. Very deliquescent on exposure to the air.

Soluble, at 15° C. (59° F.), in 0.36 part of water, and in 1.9 parts of alcohol; with increasing temperature it becomes much more soluble in both liquids.

When heated to 292° C. (557.6° F.), the salt fuses. At a higher temperature it decomposes, blackens, and evolves vapors having an empyreumatic odor (an alliaceous odor would indicate the presence of *arsenic*), and finally leaves a white residue of potassium carbonate, which should be completely soluble in water.

The aqueous solution (1 in 20) colors litmus paper blue, but does not redden phenolphthalein T.S.

Upon the addition of sodium cobaltic nitrite T.S., a copious yellow precipitate is formed.

The addition of sodium bitartrate T.S. to the aqueous solution causes a white, crystalline precipitate.

When the salt is heated with a small amount of sulphuric acid, vapors of acetic acid are evolved.

The addition of a little ferric chloride T.S. to a solution of the salt produces a deep red color, and, upon the application of heat, a pale brown, flocculent precipitate of basic ferric acetate separates.

Having prepared a solution of 2.5 Gm. of the salt in 50 Cc. of water, use 10 Cc. of it for each of the following tests:

After a portion has been acidulated with a few drops of hydrochloric acid, the addition of an equal volume of hydrogen sulphide T.S. should produce no precipitate (absence of *arsenic, lead, etc.*).

In another portion, acidulated with hydrochloric acid, 1 Cc. of barium chloride T.S. should produce no visible change (absence of *sulphate*).

If to a portion of the solution, acidulated with nitric acid, 0.1 Cc. of decinormal silver nitrate V.S. be added, the liquid should, after filtration, show no further change on the addition of more silver nitrate V.S. (limit of *chloride*).

The addition of 0.3 Cc. of potassium ferrocyanide T.S. should effect no change in the solution within fifteen minutes (limit of *iron*).

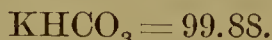
No coloration or precipitate should be produced by adding 1 Cc. of ammonium sulphide T.S. (absence of *iron, aluminum, etc.*).

Fragments of the salt, sprinkled upon sulphuric acid, should produce no effervescence (absence of *carbonate*), nor impart any color (absence of *readily carbonizable, organic impurities*).

If 1 Gm. of Potassium Acetate be, by thorough ignition, converted into carbonate, the residue should require, for complete neutralization, not less than 10 Cc. of normal sulphuric acid (corresponding to at least 98 per cent. of pure Potassium Acetate), methyl-orange being used as indicator.

POTASSII BICARBONAS.

POTASSIUM BICARBONATE.



Potassium Bicarbonate should be kept in well-stoppered bottles.

Colorless, transparent, monoclinic prisms, odorless, and having a saline and slightly alkaline taste. Permanent in the air.

Soluble in 3.2 parts of water at 15° C. (59° F.), and in 1.9 parts at 50° C. (122° F.). At a higher temperature the solution rapidly loses carbon dioxide, and, after being boiled, contains only potassium carbonate. Almost insoluble in alcohol.

The dry salt begins to lose carbon dioxide at 100° C. (212° F.), and this loss increases at a higher temperature, until, at a red heat, the salt has lost 30.97 per cent. of its original weight, leaving a residue of carbonate.

The pure salt, when dissolved in water, is at first neutral to litmus paper and to phenolphthalein T.S., but the solution soon becomes feebly alkaline by partial conversion of the salt into carbonate.

Sodium cobaltic nitrite T.S. produces in the aqueous solution a copious yellow precipitate.

Tartaric acid T.S., added to the aqueous solution in excess, causes a white, crystalline precipitate.

A solution of 0.5 Gm. of Potassium Bicarbonate in 10 Cc. of water should not at once be colored red by one drop of phenolphthalein T.S. (limit of *carbonate*).

Dissolve 2.5 Gm. of the salt in 30 Cc. of diluted acetic acid, and, having made up the volume to 50 Cc. with water, use 10 Cc. for each of the following tests:

No visible change should occur in a portion of this solution upon the addition of an equal volume of hydrogen sulphide T.S. (absence of *metallic impurities*).

The addition of 0.3 Cc. of potassium ferrocyanide T.S. to another portion should not produce a blue color within fifteen minutes (limit of *iron*).

After adding a few drops of nitric acid and 0.1 Cc. of decinormal silver nitrate V.S. to another portion, and filtering, the further addition of silver nitrate V.S. should not affect the filtrate (limit of *chloride*).

To neutralize 1 Gm. of Potassium Bicarbonate should require 10 Cc. of normal sulphuric acid (corresponding to 100 per cent. of the pure salt), methyl-orange being used as indicator.

POTASSII BICHROMAS.

POTASSIUM BICHROMATE.



[POTASSIUM DICHROMATE.]

Large, orange-red, transparent, triclinic prisms or four-sided tables, odorless, and having a bitter, metallic taste. Permanent in the air.

Soluble in 10 parts of water at 15° C. (59° F.), and in 1.5 parts of boiling water; insoluble in alcohol.

The salt fuses below a red heat, without loss of weight, forming a dark brown liquid. At a white heat it evolves oxygen and leaves a residue of neutral potassium chromate and green chromic oxide.

The aqueous solution (1 in 20) has an acid reaction upon litmus paper.

On mixing 4 Cc. of the aqueous solution with 0.5 Cc. of alcohol, and then with 1 Cc. of sulphuric acid, the liquid will assume a green color and emit the odor of aldehyde.

Sodium cobaltic nitrite T.S. produces in the aqueous solution a copious yellow precipitate.

POTASSII BITARTRAS.

POTASSIUM BITARTRATE.



[CREAM OF TARTAR.]

Colorless or slightly opaque, rhombic crystals, or a white, somewhat gritty powder, odorless, and having a pleasant, acidulous taste. Permanent in the air.

Soluble in about 201 parts of water at 15° C. (59° F.), and in about 16.7 parts of boiling water; very sparingly soluble in alcohol.

When a small portion of the salt is heated on platinum foil, it chars and emits inflammable vapors having the odor of burning sugar. At a higher temperature, with free access of air, the carbon of the black residue is oxidized, and a white, fused mass of potassium carbonate remains, which has an alkaline reaction, and effervesces strongly with acids.

The aqueous solution of the salt has an acid reaction upon litmus paper.

With sodium cobaltic nitrite T.S. it yields a copious yellow precipitate.

In the aqueous solution of the salt, rendered neutral by potassium or sodium hydrate T.S., silver nitrate T.S. produces a white precipitate which, on boiling, becomes black by the separation of metallic silver. If, before applying heat, enough ammonia water be added to dissolve the white precipitate, upon boiling the solution a mirror will be deposited on the sides of the test-tube.

If 1.5 Gm. of the salt be shaken with 30 Cc. of water and the mixture filtered, 10 Cc. of the filtrate, after being acidulated with nitric acid, should not be

rendered turbid by 0.5 Cc. of silver nitrate T.S. (absence of *chloride*), nor by 0.5 Cc. of barium chloride T.S. (absence of *sulphate*).

A solution of 0.5 Gm. of the salt in 3 Cc. of ammonia water should leave no insoluble residue (absence of *insoluble matter*), nor be affected by ammonium sulphide T.S. (absence of *copper, lead, iron, etc.*).

If 1.2 Gm. of Potassium Bitartrate be repeatedly agitated, during half an hour, with a mixture of 5 Cc. of acetic acid and 1 Cc. of water, and the mixture be then diluted with 30 Cc. of water, and filtered, the clear filtrate should not be rendered turbid, within one minute, by the addition of 0.5 Cc. of ammonium oxalate T.S. (limit of *calcium salt*).

The odor of *ammonia* should not be evolved on heating the salt with a slight excess of potassium or sodium hydrate T.S.

If 1.88 Gm. of Potassium Bitartrate be thoroughly ignited at a red heat, it should require for complete neutralization not less than 9.9 Cc. of normal sulphuric acid (each Cc. corresponding to 10 per cent. of the pure salt), methyl-orange being used as indicator.

Preparation: Pulvis Jalapæ Compositus.

POTASSII BROMIDUM.

POTASSIUM BROMIDE.

$\text{KBr} = 118.79.$

Colorless or white, cubical crystals, or granules, odorless, and having a pungent, saline taste. Permanent in the air.

Soluble, at 15° C. (59° F.), in about 1.6 parts of water, and in 200 parts of alcohol; in less than 1 part of boiling water, and in 16 parts of boiling alcohol; also soluble in 4 parts of glycerin.

On heating the salt upon platinum foil, it decrepitates; near 700° C. (1290° F.) it fuses without decomposing, and at a bright red heat it volatilizes, communicating a violet color to the flame.

The aqueous solution (1 in 20) is neutral, or has, at most, only a scarcely perceptible alkaline reaction upon litmus paper.

The addition of tartaric acid T.S., or of sodium bitartrate T.S., produces in it, after some time, a white crystalline precipitate.

Sodium cobaltic nitrite T.S. produces in it at once a copious yellow precipitate.

If to 10 Cc. of the aqueous solution of the salt a few drops of chloroform be added, then 1 Cc. of chlorine water, and the mixture be agitated, the liberated bromine will dissolve in the chloroform, imparting to it a yellow or brownish-yellow color without a violet tint.

If 1 Gm. of the salt be dissolved in 10 Cc. of a mixture of 100 Cc. of water and 0.2 Cc. of normal sulphuric acid, no red tint should be imparted to the solution by the addition of a few drops of phenolphthalein T.S. (limit of *potassium carbonate*).

If a little of the salt be held in a non-luminous flame on a perfectly clean platinum wire, the flame should be colored violet at once, without any appearance of yellow (absence of *sodium*).

If diluted sulphuric acid be dropped upon crushed crystals of the salt, they should not at once assume a yellow color (absence of *bromate*).

If 10 Cc. of the aqueous solution (1 in 20) of the salt be mixed with a little starch T.S., the addition of a few drops of chlorine water should not produce a blue color (absence of *iodine*).

Ten Cc. of the aqueous solution (1 in 12) should not be rendered turbid by the addition of 0.5 Cc. of ammonia water and of 0.5 Cc. of ammonium sulphide T.S. (absence of *iron, aluminum, etc.*); nor should 10 Cc., after being slightly acidulated with acetic acid, be rendered turbid by an equal volume of hydrogen sulphide T.S. (absence of *arsenic, lead, copper, etc.*); nor by 0.5 Cc. of ammonium oxalate T.S. (*calcium*); nor by 0.5 Cc. of potassium sulphate

T.S. (*barium*); nor by 0.5 Cc. of barium chloride T.S. (*sulphate*); nor be colored blue by 0.5 Cc. of potassium ferrocyanide T.S. (*iron*).

If 0.5 Gm. of the well-dried salt be dissolved in 10 Cc. of water, and 2 drops of potassium chromate T.S. be added, it should not require more than 42.85 Cc. of decinormal silver nitrate V.S. to produce a permanent red color of silver chromate (absence of more than 3 per cent. of *chloride*).

POTASSII CARBONAS.

POTASSIUM CARBONATE.



Potassium Carbonate should be kept in well-stoppered bottles.

A white, granular powder, odorless, and having a strongly alkaline taste; very deliquescent.

Soluble in 1.1 parts of water at 15° C. (59° F.), and in about 0.65 part of boiling water; insoluble in alcohol.

When heated to 130° C. (266° F.), the salt loses all the water which it may have retained or absorbed; at a bright red heat it melts, and at a white heat it volatilizes, communicating to the flame a pure violet color.

Its aqueous solution (1 in 20) has a strongly alkaline reaction upon litmus paper, and effervesces with acids.

With excess of tartaric acid T.S. it slowly yields a white, crystalline precipitate; with sodium cobaltic nitrite T.S. a copious yellow precipitate is formed at once.

When a small portion of the salt, treated with a drop of hydrochloric acid, is introduced into a non-luminous flame on a perfectly clean platinum wire, the flame should be colored violet at once, without any appearance of yellow (absence of *sodium*).

No residue should be left on dissolving 1 Gm. of the salt in 20 Cc. of water (absence of *earthy impurities*).

No precipitate or coloration should be produced in the aqueous solution (1 in 20) by an equal volume of hydrogen sulphide T.S. (absence of *metallic impurities*).

On neutralizing the solution with hydrochloric acid, no odor of burning sulphur, nor any white precipitate, should appear (absence of *hyposulphite*).

If 2 Cc. of the aqueous solution (1 in 20) be carefully mixed with an equal volume of concentrated sulphuric acid, and, after cooling, 1 Cc. of ferrous sulphate T.S. be poured upon it so as to form a separate layer, no brown color should appear at the line of contact (absence of *nitrate*).

If 0.5 Gm. of Potassium Carbonate be dissolved in 5 Cc. of diluted hydrochloric acid and 5 Cc. of water, the addition of 1 Cc. of barium chloride T.S. should not produce any turbidity (absence of *sulphate*).

A solution of 0.5 Gm. of the salt in 5 Cc. of diluted hydrochloric acid mixed with 5 Cc. of water should not be colored blue within fifteen minutes by 0.3 Cc. of potassium ferrocyanide T.S. (limit of *iron*).

If 0.5 Gm. of the salt be dissolved in 6 Cc. of diluted nitric acid and 4 Cc. of water, then 0.1 Cc. of decinormal silver nitrate V.S. be added, and the mixture filtered, no change should be produced in the filtrate by the further addition of silver nitrate V.S. (limit of *chloride*).

If 10 Cc. of the aqueous solution (1 in 20) be mixed with 2 drops, each, of ferrous sulphate T.S. and ferric chloride T.S., and the mixture heated, and slightly supersaturated with hydrochloric acid, no blue color should appear (absence of *cyanide*).

The addition of a few drops of lead acetate T.S. to the aqueous solution should produce a pure white precipitate (absence of *sulphide*).

To neutralize 0.69 Gm. of Potassium Carbonate should require not less than 9.5 Cc. of normal sulphuric acid (each Cc. corresponding to 10 per cent. of the pure salt), methyl-orange being used as indicator.

POTASSII CHLORAS.

POTASSIUM CHLORATE.



Potassium Chlorate should be kept in glass-stoppered bottles, and *great caution should be observed* in handling the salt, as dangerous explosions are liable to occur, when it is mixed with organic matters (cork, tannic acid, sugar, etc.), or with sulphur, antimony sulphide, phosphorus, or other easily oxidizable substances, and either heated directly, or subjected to trituration or concussion.

Colorless, lustrous, monoclinic prisms or plates, or a white powder, odorless, and having a cooling, saline taste. Permanent in the air.

Soluble in 16.7 parts of water at 15° C. (59° F.), and in 1.7 parts of boiling water; insoluble in absolute alcohol, and but slightly soluble in mixtures of alcohol and water.

At 234° C. (453.2° F.) the salt fuses, and above 352° C. (665.6° F.) it is decomposed into oxygen and potassium perchlorate; above 400° C. (752° F.) all its oxygen is liberated, and a white residue of potassium chloride remains, amounting to 60.8 per cent. of the chlorate employed. This residue is readily soluble in water, and the solution yields a white, curdy precipitate with silver nitrate T.S.

The aqueous solution (1 in 20) of the salt is neutral to litmus paper.

With excess of tartaric acid T.S. the solution slowly yields a scant, white, crystalline precipitate; with sodium cobaltic nitrite T.S., or with platinic chloride T.S., a copious yellow precipitate is produced at once.

When introduced into a non-luminous flame on a clean platinum wire, Potassium Chlorate communicates to the flame a pure violet color, without admixture of yellow (absence of *sodium*).

When heated with hydrochloric acid, the aqueous solution assumes a greenish-yellow color, and evolves chlorine.

Separate portions, each of 5 Cc., of the aqueous solution (1 in 20) should not be rendered turbid by 0.5 Cc. of barium chloride T.S. (absence of *sulphate*); nor by 0.5 Cc. of ammonium oxalate T.S. (*calcium*); nor by 0.5 Cc. of silver nitrate T.S. (*chloride*); nor should an equal volume of hydrogen sulphide T.S. produce either a precipitate or a coloration (absence of *metals*).

If a mixture of 1 Gm. of the salt with 0.5 Gm., each, of iron and of zinc, in coarse powder or filings, be heated with 5 Cc. of potassium hydrate T.S., no evolution of *ammonia* should be perceptible either by moistened red litmus paper or by odor (absence of *nitrate* or *nitrite*).

Preparation: Trochisci Potassii Chloratis.

POTASSII CITRAS.

POTASSIUM CITRATE.



Potassium Citrate should be kept in well-stoppered bottles.

Transparent, prismatic crystals, or a white, granular powder, odorless, and having a cooling, saline taste. Deliquescent on exposure to air.

Soluble in 0.6 part of water at 15° C. (59° F.), and very soluble in boiling water; sparingly soluble in alcohol.

When heated above 100° C. (212° F.), the salt begins to lose water ; at 200° C. (392° F.) the water of crystallization (5.55 per cent.) is completely lost. At 230° C. (446° F.) the salt begins to decompose, turns brown, and at a higher temperature carbonizes and emits inflammable gases which have a very pungent, acid odor. At a red heat a blackened mass of potassium carbonate and carbon is left, which has an alkaline reaction, and strongly effervesces with acids.

The aqueous solution of the salt is neutral to litmus paper.

The salt yields a white, crystalline precipitate with sodium bitartrate T.S.

With sodium cobaltic nitrite T.S. a yellow precipitate is formed.

On mixing 10 Cc. of the aqueous solution (1 in 20) with 2.5 Cc. of calcium chloride T.S., the liquid remains clear until it is boiled, when a white, granular precipitate is produced.

The aqueous solution (1 in 20) should not be colored red by a drop of phenolphthalein T.S., nor effervesce on the addition of an acid (absence of carbonate).

Separate portions of this solution acidulated with nitric acid should not be affected by barium chloride T.S. (absence of *sulphate*), nor by silver nitrate T.S. (absence of *chloride*).

A solution of 1 Gm. of Potassium Citrate in 1 Cc. of water should not deposit any precipitate on the addition of 1 Cc. of acetic acid (absence of *tartrate*).

If 1.08 (1.079) Gm. of Potassium Citrate be thoroughly ignited at a red heat, it should require for complete neutralization not less than 10 Cc. of normal sulphuric acid (corresponding to 100 per cent. of the pure salt), methyl-orange being used as indicator.

POTASSII CITRAS EFFERVESCENS.

EFFERVESCENT POTASSIUM CITRATE.

Citric Acid, <i>sixty-three grammes</i>	63 Gm.
Potassium Bicarbonate, <i>ninety grammes</i>	90 Gm.
Sugar, <i>forty-seven grammes</i>	47 Gm.

Powder the ingredients separately, and mix them thoroughly in a warm mortar. Dry the resulting, uniform paste rapidly at a temperature not exceeding 120° C. (248° F.), and, when it is perfectly dry, reduce it to a powder of the desired degree of fineness.

Keep the product in well-stoppered bottles.

POTASSII CYANIDUM.

POTASSIUM CYANIDE.

$$\text{KCN} = 65.01.$$

Potassium Cyanide should be kept in well-stoppered bottles.

White, opaque, amorphous pieces, or a white, granular powder, odorless when perfectly dry, but in moist air exhaling the odor of hydrocyanic acid. The taste is sharp, and somewhat alkaline, but should be ascertained with great care, as *the salt is very poisonous*. In moist air the salt deliquesces.

Soluble in about 2 parts of water at 15° C. (59° F.). Boiling water dissolves its own weight of the salt, but rapidly decomposes it. In alcohol it is but sparingly soluble.

At a low red heat the salt fuses.

Its aqueous solution (1 in 20) has a strongly alkaline reaction, and emits the odor of hydrocyanic acid.

With an equal volume of sodium bitartrate T.S. it yields a white, crystalline precipitate.

With sodium cobaltic nitrite T.S. a copious yellow precipitate is produced.

A few drops of the solution give with silver nitrate T.S. a white precipitate, which is soluble in an excess of the solution of potassium cyanide, also in ammonia water, and in concentrated nitric acid (distinction from *silver chloride*).

If 5 Cc. of the solution be shaken with a few drops of ferrous sulphate T.S., and a slight excess of hydrochloric acid then added, a blue precipitate (Prussian blue) will be produced.

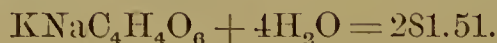
The aqueous solution (1 in 20) should not produce more than a slight effervescence on the addition of diluted hydrochloric acid (limit of *carbonate*).

After the acid has been added in slight excess, a drop of ferric chloride T.S. should produce neither a blue (absence of *ferrocyanide*) nor a red color (*sulphocyanate*).

A solution of 0.65 Gm. of Potassium Cyanide in 12 Cc. of water should require the addition of at least 45 Cc. of decinormal silver nitrate V.S. before the precipitate, which at first redissolves on agitation, becomes permanent (each Cc. of the volumetric solution indicating 2 per cent. of the pure salt).

POTASSII ET SODII TARTRAS.

POTASSIUM AND SODIUM TARTRATE.



[ROCHELLE SALT.]

Colorless, transparent, rhombic prisms, or a white powder, odorless, and having a cooling, saline taste. The crystals slightly effloresce in dry air.

Soluble in 1.4 parts of water at 15° C. (59° F.), and in less than 1 part of boiling water; almost insoluble in alcohol.

When heated to 74° C. (165.2° F.), the salt fuses to a colorless liquid, which, at a higher temperature, froths, becomes brown, and gradually carbonizes, while inflammable vapors are emitted, having the odor of burning sugar. Finally a black residue is left, consisting of alkaline carbonate mixed with carbon.

The aqueous solution of the salt is neutral to litmus paper.

A 10-per-cent. aqueous solution yields, with an equal volume of acetic acid, a white, crystalline precipitate.

With sodium cobaltic nitrite T.S. the solution yields a copious yellow precipitate.

With silver nitrate T.S. it produces a white precipitate, which becomes black on boiling.

To a non-luminous flame it communicates a yellow color (*sodium*), which, when viewed through a blue glass, appears violet-red (*potassium*).

The aqueous solution (1 in 20) should not be rendered turbid by the addition of a small amount of ammonium oxalate T.S. (absence of *calcium*), nor by an equal volume of hydrogen sulphide T.S., either before or after acidulation with diluted hydrochloric acid (absence of *arsenic*, *lead*, *copper*, etc.).

When heated with potassium hydrate T.S., the solution should not give off the odor of *ammonia*.

If 10 Cc. of the solution (1 in 20) be mixed with 1 Cc. of hydrochloric acid, the addition of 1 Cc. of barium chloride T.S. should produce no turbidity (absence of *sulphate*).

If 0.36 Gm. of the salt be dissolved in 9 Cc. of water, then 1 Cc. of nitric acid and 0.2 Cc. of decinormal silver nitrate V.S. be added, and the mixture filtered, the filtrate should remain clear upon the further addition of silver nitrate V.S. (limit of *chloride*).

If 1.41 Gm. of Potassium and Sodium Tartrate be completely decomposed by ignition, the alkaline residue should require for complete neutralization not less than 10 Cc. of normal sulphuric acid (corresponding to 100 per cent. of the pure salt), methyl-orange being used as indicator.

Preparation: Pulvis Effervescens Compositus.

POTASSII FERROCYANIDUM.

POTASSIUM FERROCYANIDE.



[YELLOW PRUSSIAN OF POTASH.]

Large, soft, transparent, yellow, four-sided, monoclinic tables, odorless, and having a mild, saline taste. Slightly efflorescent on exposure to dry air.

Soluble in 4 parts of water at 15° C. (59° F.), and in 2 parts of boiling water; insoluble in alcohol.

When heated to 60° C. (140° F.), the salt begins to turn white from loss of water, and when heated to 100° C. (212° F.), it is rendered anhydrous.

The aqueous solution is neutral to litmus paper.

With sodium bitartrate T.S. the aqueous solution yields a white, crystalline precipitate.

Sodium cobaltic nitrite T.S. produces a copious yellow precipitate.

The color of the precipitate produced by ferric chloride T.S. is dark blue; that produced by copper sulphate T.S. is reddish-brown; while lead acetate T.S. or silver nitrate T.S. throws down a pure white precipitate.

No effervescence should be caused by the addition of diluted sulphuric acid to a concentrated solution of the salt (absence of *carbonate*).

The aqueous solution (1 in 20), acidulated with hydrochloric acid, should, upon the addition of barium chloride T.S., remain clear, or at most show but a trifling turbidity (limit of *sulphate*).

If a mixture of 0.5 Gm. of the salt with 1.5 Gm. of pure potassium nitrate and 0.5 Gm. of pure, anhydrous sodium carbonate be heated to redness in a porcelain crucible, the residue dissolved in water, the filtered solution supersaturated with nitric acid, mixed with 0.1 Cc. of decinormal silver nitrate V.S., and again filtered, no turbidity should be produced in the filtrate by the further addition of silver nitrate V.S. (limit of *chloride*).

The precipitate produced in the aqueous solution, acidulated with nitric acid, by silver nitrate T.S. should be of a pure white color, without a tinge of red (absence of *ferricyanide*).

POTASSII HYPOPHOSPHIS.

POTASSIUM HYPOPHOSPHITE.



Potassium Hypophosphite should be kept in well-stoppered bottles.

White, opaque, hexagonal plates, or crystalline masses, or a granular powder, odorless, and having a pungent, saline taste; very deliquescent.

Soluble, at 15° C. (59° F.), in 0.6 part of water, and in 7.3 parts of alcohol; in 0.3 part of boiling water, and in 3.6 parts of boiling alcohol; insoluble in ether.

When heated in a dry test-tube, the salt at first loses moisture, and then evolves spontaneously inflammable hydrogen phosphide gas, which burns with a bright yellow flame.

On triturating or heating the salt with nitrates, chlorates, or other oxidizing agents, it detonates violently.

The aqueous solution (1 in 20) is neutral to litmus paper, and yields, with sodium bitartrate T.S., a white, crystalline precipitate.

With silver nitrate T.S. a white precipitate is formed, which rapidly turns brown and black, owing to the separation of metallic silver.

If a small quantity of an aqueous solution of the salt be acidulated with hydrochloric acid, and mercuric chloride T.S. added, so that the latter remain in excess, a white precipitate of mercurous chloride will at first be produced, which, upon further addition of the acidulated solution, is reduced to metallic mercury.

The aqueous solution of the salt (1 in 20) should not effervesce on the addition of an acid (absence of *carbonate*); nor should it be rendered turbid by ammonium oxalate T.S. (absence of *calcium*).

Separate portions of 5 Cc. of the aqueous solution (1 in 20), heated with 1 Cc. of nitric acid, should remain clear upon the addition of silver nitrate T.S. (absence of *chloride*), or of barium chloride T.S. (absence of *sulphate*).

Not more than a slight cloudiness should be produced in the aqueous solution of the salt by the addition of magnesia mixture (limit of *phosphate*).

If 0.1 Gm. of dry Potassium Hypophosphite be dissolved in 10 Cc. of water, then mixed with 7.5 Cc. of sulphuric acid and 40 Cc. of decinormal potassium permanganate V.S., and the mixture be boiled for fifteen minutes, it should not require more than 2 Cc. of decinormal oxalic acid V.S. to discharge the red color (corresponding to at least 98.7 per cent. of the pure salt).

Preparation: Syrupus Hypophosphitum.

POTASSII IODIDUM.

POTASSIUM IODIDE.

KI = 165.56.

Potassium Iodide should be kept in well-stoppered bottles.

Colorless, transparent or translucent, cubical crystals (the white, opaque, commercial variety being crystallized from an alkaline solution, and less pure), or a white, granular powder, having a peculiar, faint, iodine-like odor, and a pungent, saline, afterwards bitter taste. Permanent in dry air, and but slightly deliquescent in moist air.

Soluble, at 15° C. (59° F.), in 0.75 part of water, and in 18 parts of alcohol; in 0.5 part of boiling water, and in 6 parts of boiling alcohol; also soluble in 2.5 parts of glycerin.

When heated, the salt decrepitates. At a low red heat it fuses, and at a bright red heat it is volatilized without decomposition.

Its aqueous solution is neutral, or has, at most, a scarcely perceptible alkaline reaction upon litmus paper.

The salt yields a white, crystalline precipitate with sodium bitartrate T.S.

If to 5 Cc. of the aqueous solution (1 in 20) of the salt 1 Cc. of chlorine water be added, iodine will be liberated, and impart to the solution a yellow color. On agitating the mixture with a few drops of chloroform, this will acquire a violet color.

No residue should be left when 1 Gm. of the salt is dissolved in 2 Cc. of diluted alcohol of specific gravity 0.928 (absence of *less soluble salts*).

If 1 Gm. of the salt be dissolved in water and 0.05 Cc. (one drop) of decinormal oxalic acid V.S. be added, no color should be produced by the subsequent addition of a drop of phenolphthalein T.S., even after heating (limit of *alkali*).

When a fragment of the salt is brought into a non-luminous flame on a clean platinum wire, a violet color should appear at once (absence of *sodium*).

If to a solution of the salt (1 in 20) in distilled water, from which all gases have been expelled by boiling, a little starch T.S. be added, and then a few drops of pure diluted sulphuric acid T.S., no blue color should appear at once (absence of *iodate*).

The aqueous solution (1 in 20) should not be colored or precipitated by the addition of an equal volume of hydrogen sulphide T.S., either before or after acidulation with hydrochloric acid (absence of *arsenic, lead, copper, etc.*).

The aqueous solution should remain clear after the addition of barium chloride T.S. (absence of *sulphate*).

If 1 Gm. of the salt be mixed with 0.5 Gm., each, of iron and of zinc, in coarse powder or filings, and heated in a test-tube with 5 Cc. of sodium hydrate T.S., no ammoniacal vapors should be evolved (absence of *nitrate or nitrite*).

No blue color should be communicated to 5 Cc. of the aqueous solution (1 in 20) by 0.1 Cc. (2 drops) of potassium ferrocyanide T.S. (absence of *iron*).

If 5 Cc. of the aqueous solution be gently heated with 1 drop of ferrous sulphate T.S. and 0.5 Cc. of potassium hydrate T.S., no blue color should appear after acidulating the mixture with hydrochloric acid (absence of *cyanide*).

If 0.5 Gm. of the well-dried salt be dissolved in 10 Cc. of water, and 2 drops of potassium chromate T.S. be added, it should require not more than 30.25 Cc. nor less than 30 Cc. of decinormal silver nitrate V.S. to produce a permanent red color of silver chromate (corresponding to at least 99.5 per cent. of the pure salt).

Preparation: Unguentum Potassii Iodidi.

POTASSII NITRAS.

POTASSIUM NITRATE.



[SALTPETRE.]

Colorless, transparent, six-sided, rhombic prisms, or a crystalline powder, odorless, and having a cooling, saline and pungent taste. Permanent in the air.

Soluble in 3.8 parts of water at 15° C. (59° F.), and in 0.4 part of boiling water; very sparingly soluble in alcohol.

When heated to 353° C. (667.4° F.), the salt melts. At a higher temperature it is decomposed, giving off oxygen at first, and then some of its nitrogen, leaving a residue of potassium nitrate, nitrite, and oxide. Thrown upon red-hot coals, the salt deflagrates.

The aqueous solution is neutral to litmus paper.

With sodium bitartrate T.S. the aqueous solution (1 in 20) yields a white, crystalline precipitate; with sodium cobaltic nitrite T.S., a yellow precipitate.

If a small crystal of ferrous sulphate be dissolved in the aqueous solution (1 in 20), and then concentrated sulphuric acid be poured in, so as to form a separate layer, a dark brown color will appear at the line of contact.

If a drop of diphenylamine T.S. be mixed with the aqueous solution and concentrated sulphuric acid be poured in as in the preceding test, a deep blue color will appear at the line of contact.

The aqueous solution (1 in 20) should remain unaffected by the addition of a few drops of potassium ferrocyanide T.S. (absence of *iron*); or of barium chloride T.S. (*sulphate*); or of silver nitrate T.S. (*chloride*); or of ammonium carbonate T.S., ammonium oxalate T.S., or ammonium sulphide T.S. (absence of *calcium*, *zinc*, etc.); or by the addition of an equal volume of hydrogen sulphide T.S., either before or after acidulation with hydrochloric acid (absence of *arsenic*, *lead*, *copper*, etc.).

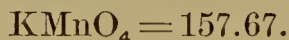
If to 5 Cc. of the aqueous solution of the salt 1 Cc. of chlorine water and a few drops of starch T.S. be added, no blue color should appear (absence of *iodine*).

No yellow color should appear when 1 Cc. of pure, concentrated sulphuric acid is added to 0.1 Gm. of the dry salt (absence of *chlorate*).

Preparations: Argenti Nitras Dilutus. Charta Potassii Nitratis.

POTASSII PERMANGANAS.

POTASSIUM PERMANGANATE.



Potassium Permanganate should be kept in glass-stoppered bottles, protected from light, and should not be brought in contact with organic or readily oxidizable substances.

Slender, monoclinic prisms, of a dark purple color, almost opaque by transmitted and of a blue, metallic lustre by reflected light, odorless, and having a taste at first sweet, but afterwards disagreeable and astringent. Permanent in the air.

Soluble in 16 parts of water at 15° C. (59° F.), and in 3 parts of boiling water. In contact with alcohol it is decomposed.

When heated, the salt decrepitates, and at 240° C. (464° F.) it decomposes, yielding oxygen, potassium manganate, and manganese dioxide.

The aqueous solution of the salt is of a deep violet-red color when concentrated, and of a rose color when much diluted, and this color is discharged by hydrogen sulphide, ferrous sulphate, oxalic acid, alcohol, and many other readily oxidizable substances, especially if the solution be first rendered acid by sulphuric acid.

The solution is neutral to litmus paper.

If 0.5 Gm. of the salt be boiled with 10 Cc. of ammonia water and 10 Cc. of water (or with 20 Cc. of water and 4 Cc. of alcohol) until it is completely decomposed, and the liquid then filtered, the clear, colorless filtrate will serve for the following tests:

If to 5 Cc. of the filtrate, acidulated with nitric acid, barium chloride T.S. be added, not more than very slight turbidity should be produced (limit of *sulphate*).

In another portion of 5 Cc., acidulated with nitric acid, silver nitrate T.S. should produce no precipitate or cloudiness (absence of *chloride*).

If to another portion of 5 Cc. of the filtrate 1 drop of diphenylamine T.S. be added, and then 1 Cc. of pure, concentrated sulphuric acid be poured in, so as to form a layer beneath, no blue color should appear at the line of contact (absence of *nitrate* or *chlorate*).

If 0.1 Gm. of the salt be dissolved in 10 Cc. of boiling distilled water, and 1 Cc. of sulphuric acid be cautiously added, the solution should require for complete decoloration not less than 31.3 Cc. of decinormal oxalic acid V.S. (corresponding to at least 98.7 per cent. of the pure salt).

POTASSII SULPHAS.**POTASSIUM SULPHATE.**

Hard, colorless, transparent, six-sided, rhombic prisms terminated by pyramids, or a white powder, odorless, and having a somewhat bitter, saline taste. Permanent in the air.

Soluble in about 9.5 parts of water at 15° C. (59° F.), and in 4 parts of boiling water; insoluble in alcohol.

When heated, the crystals decrepitate. At a bright red heat they fuse, and at a white heat the salt suffers partial decomposition.

The aqueous solution is neutral to litmus paper.

The aqueous solution of the salt yields a copious yellow precipitate with sodium cobaltic nitrite T.S., and a white, crystalline precipitate with excess of tartaric acid T.S.

When held in a non-luminous flame on a clean platinum wire, the salt should at once impart to the flame a violet color (absence of *sodium*).

The aqueous solution (1 in 20) should remain unaffected by the addition of an equal volume of hydrogen sulphide T.S. either before or after acidulation with hydrochloric acid (absence of *arsenic, lead, copper*, etc.); or by the addition of a small amount of ammonium sulphide T.S. (absence of *zinc, iron, aluminum*, etc.).

Other portions of the aqueous solution should not be rendered turbid by the addition of ammonium oxalate T.S. (absence of *calcium*); or of sodium phosphate T.S. and ammonia water (*magnesium*); or of silver nitrate T.S. (*chloride*).

The addition of potassium ferrocyanide T.S. should produce neither a blue (absence of *iron*) nor a red color (*copper*).

PRUNUM.**PRUNE.**

The fruit of *Prunus domestica* Linné (nat. ord. *Rosaceæ*).

Oblong or subglobular, about 3 Cm. long, shrivelled, blackish-blue, glaucous; the sarcocarp brownish-yellow, sweet and acidulous; putamen hard, smooth, or irregularly ridged; the seed almond-like in shape, but smaller, and of a bitter-almond taste.

Preparation: Confectio Sennæ.

PRUNUS VIRGINIANA.**WILD CHERRY.**

The bark of *Prunus serotina* Ehrhart (nat. ord. *Rosaceæ*), collected in autumn.

In curved pieces or irregular fragments, 2 Mm. or more thick, outer surface greenish-brown, or yellowish-brown, smooth and somewhat glossy, marked with transverse scars; if the bark is collected from old wood and deprived of the corky layer, the outer surface is nut-brown and uneven; inner surface somewhat striate or fissured. Upon maceration in water it develops a distinct bitter-almond odor; its taste is astringent, aromatic and bitter.

The bark of the very large and of the very small branches is to be rejected.

Preparations: Extractum Pruni Virginianæ Fluidum. Infusum Pruni Virginianæ. Syrupus Pruni Virginianæ.

PULSATILLA.

PULSATILLA.

The herb of *Anemone Pulsatilla* and of *Anemone pratensis* Linné (nat. ord. *Ranunculaceæ*), collected soon after flowering.

It should be carefully preserved, and not be kept longer than one year.

Leaves radical, petiolate, silky-villous, twice or thrice deeply three-parted or pinnately cleft, with linear, acute lobes, appearing after the large, purple flowers; inodorous, very acrid.

PULVIS ANTIMONIALIS.

ANTIMONIAL POWDER.

[JAMES' POWDER.]

Antimony Oxide, *thirty-three grammes*..... 33 Gm.

Precipitated Calcium Phosphate, *sixty-seven grammes*.. 67 Gm.

To make *one hundred grammes*.... 100 Gm.

Mix them intimately.

PULVIS AROMATICUS.

AROMATIC POWDER.

Ceylon Cinnamon, in No. 60 powder, *thirty-five grammes* 35 Gm.

Ginger, in No. 60 powder, *thirty-five grammes* 35 Gm.

Cardamom, deprived of the capsules and crushed, *fifteen grammes* 15 Gm.

Nutmeg, in No. 20 powder, *fifteen grammes* 15 Gm.

To make *one hundred grammes*.... 100 Gm.

Triturate the Cardamom and Nutmeg with a portion of the Ceylon Cinnamon, until they are reduced to a fine powder; then add the remainder of the Cinnamon and the Ginger, and rub them together until they are thoroughly mixed.

Preparation: Extractum Aromaticum Fluidum.

PULVIS CRETÆ COMPOSITUS.

COMPOUND CHALK POWDER.

Prepared Chalk, *thirty grammes*..... 30 Gm.

Acacia, in fine powder, *twenty grammes* 20 Gm.

Sugar, in fine powder, *fifty grammes*..... 50 Gm.

To make *one hundred grammes*.... 100 Gm.

Mix them intimately.

Preparation: Mistura Cretæ.

PULVIS EFFERVESCENS COMPOSITUS.

COMPOUND EFFERVESCING POWDER.

[SEIDLITZ POWDER.]

Sodium Bicarbonate, in fine powder, <i>thirty-one grammes</i>	31 Gm.
Potassium and Sodium Tartrate, in fine powder, <i>ninety-three grammes</i>	93 Gm.
Tartaric Acid, in fine powder, <i>twenty-seven grammes</i>	27 Gm.

Mix the Sodium Bicarbonate intimately with the Potassium and Sodium Tartrate, divide the mixture into *twelve* (12) *equal parts*, and wrap each part in a separate paper of some pronounced color, as *blue*.

Then divide the Tartaric Acid also into *twelve* (12) *equal parts*, and wrap each part in a separate paper of a color distinctly different from that used for wrapping the mixture, as *white*.

Keep the powders in well-closed vessels.

PULVIS GLYCYRRHIZÆ COMPOSITUS.

COMPOUND POWDER OF GLYCYRRHIZA.

Senna, in No. 80 powder, <i>one hundred and eighty grammes</i>	180 Gm.
Glycyrrhiza, in No. 80 powder, <i>two hundred and thirty-six grammes</i>	236 Gm.
Washed Sulphur, <i>eighty grammes</i>	80 Gm.
Oil of Fennel, <i>four grammes</i>	4 Gm.
Sugar, in fine powder, <i>five hundred grammes</i>	500 Gm.
To make <i>one thousand grammes</i>	1000 Gm.

Mix the Oil of Fennel thoroughly with about one-half of the Sugar, then add the remainder of the Sugar and the other ingredients, and mix thoroughly. Finally pass the powder through a No. 60 sieve, and keep it in well-closed vessels.

PULVIS IPECACUANHÆ ET OPII.

POWDER OF IPECAC AND OPIUM.

[DOVER'S POWDER.]

Ipecac, in No. 60 powder, <i>ten grammes</i>	10 Gm.
Powdered Opium, <i>ten grammes</i>	10 Gm.
Sugar of Milk, in No. 30 powder, <i>eighty grammes</i>	80 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Rub them together into a very fine powder.

PULVIS JALAPÆ COMPOSITUS.**COMPOUND POWDER OF JALAP.**

[PULVIS PURGANS.]

Jalap, in No. 60 powder, <i>thirty-five grammes</i>	35 Gm.
Potassium Bitartrate, in fine powder, <i>sixty-five grammes</i> . .	65 Gm.
To make <i>one hundred grammes</i> . .	100 Gm.

Rub them together until they are thoroughly mixed.

PULVIS MORPHINÆ COMPOSITUS.**COMPOUND POWDER OF MORPHINE.**

[TULLY'S POWDER.]

Morphine Sulphate, <i>one gramme</i>	1 Gm.
Camphor, <i>nineteen grammes</i>	19 Gm.
Glycyrrhiza, in No. 60 powder, <i>twenty grammes</i>	20 Gm.
Precipitated Calcium Carbonate, <i>twenty grammes</i>	20 Gm.
Alcohol, <i>a sufficient quantity</i> ,	
To make <i>sixty grammes</i> . . .	60 Gm.

Rub the Camphor with a little Alcohol, and afterwards with the Glycyrrhiza and Precipitated Calcium Carbonate, until a uniform powder is produced. Then rub the Morphine Sulphate with this powder, gradually added, until the whole is thoroughly mixed. Finally, pass the powder through a No. 40 sieve, and transfer it to well-stoppered bottles.

PULVIS RHEI COMPOSITUS.**COMPOUND POWDER OF RHUBARB.**

Rhubarb, in No. 60 powder, <i>twenty-five grammes</i>	25 Gm.
Magnesia, <i>sixty-five grammes</i>	65 Gm.
Ginger, in No. 60 powder, <i>ten grammes</i>	10 Gm.
To make <i>one hundred grammes</i> . . .	100 Gm.

Rub them together until they are thoroughly mixed.

PYRETHRUM.**PYRETHRUM.**

[PELLITORY.]

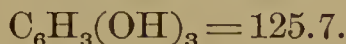
The root of *Anaelytus Pyrethrum* (Linné) De Candolle (nat. ord. *Compositæ*).

From 5 to 10 Cm. long, and 1 to 2 Cm. thick, somewhat fusiform, nearly simple, annulate above, wrinkled below, externally dark grayish-brown; internally brownish-white; fracture short; bark rather thick, containing two circles of resin-cells, and surrounding the slender wood-bundles and medullary rays, the latter having about four circles of shining resin-cells; inodorous, pungent, and very acrid.

Preparation: Tinctura Pyrethri.

PYROGALLOL.

PYROGALLOL.



[PYROGALLIC ACID.]

A triatomic phenol obtained chiefly by the dry distillation of gallic acid.

Pyrogallol should be kept in dark amber-colored bottles.

Light white, shining laminae, or fine needles, odorless, and having a bitter taste; acquiring a gray or darker tint on exposure to air and light.

Soluble, at 15° C. (59° F.), in 1.7 parts of water, and in 1 part of alcohol; very soluble in boiling water, and in boiling alcohol; also soluble in 1.2 parts of ether.

When heated to 131° C. (267.8° F.), Pyrogallol melts, and may be sublimed unchanged. When ignited, it is consumed, leaving no residue.

The aqueous solution, which is at first neutral and colorless, gradually acquires, by exposure to the air, a brown color and an acid reaction due to absorption of oxygen. The same change of color takes place very rapidly if the solution contains a caustic alkali.

The aqueous solution (1 in 10) of Pyrogallol reduces solutions of the salts of silver, gold, and mercury, even in the cold.

When freshly prepared, 1 Cc. of the aqueous solution (1 in 20) is colored brownish-red by a few drops of ferric chloride T.S., and this color is changed to deep bluish-black on the addition of 1 or 2 drops of ammonia water. A bluish-black color is also produced in the aqueous solution of Pyrogallol by freshly prepared ferrous sulphate T.S.

PYROXYLINUM.

PYROXYLIN.

[SOLUBLE GUN COTTON. COLLOXYLIN.]

Purified Cotton, *one hundred grammes* 100 Gm.

Nitric Acid, *fourteen hundred cubic centimeters* 1400 Cc.

Sulphuric Acid, *twenty-two hundred cubic centimeters* 2200 Cc.

Alcohol,

Ether,

Water, each, *a sufficient quantity*.

Mix the Acids gradually in a glass or porcelain vessel, and, when the temperature of the mixture has fallen to 32° C. (90° F.), add the Purified Cotton. By means of a glass rod imbue it thoroughly with

the Acids, and allow it to macerate, until a sample of it, taken out, thoroughly washed with a large quantity of Water, and subsequently with Alcohol, and pressed, is found to be soluble in a mixture of *one* (1) *volume* of Alcohol and *three* (3) *volumes* of Ether. Then remove the Cotton from the Acids, transfer it to a larger vessel, and wash it, first, with cold Water, until the washings cease to have an acid taste, and then with boiling Water, until they cease to redden blue litmus paper. Finally, drain the Pyroxylin on filtering paper, and dry it in small, detached pellets, by means of a water-bath or steam-bath, at a temperature not exceeding 60° C. (140° F.).

Keep the Pyroxylin, loosely packed, in well-closed vessels containing not more than about 25 Gm., in a cool and dry place, remote from lights or fire.

Preparation: Collodium.

QUASSIA.

QUASSIA.

The wood of *Picræna excelsa* (Swartz) Lindley (nat. ord. *Simarubææ*).

In billets of various sizes, dense, tough, of medium hardness, porous, with a minute pith and narrow, medullary rays; inodorous, and intensely bitter.

In the shops it is usually met with in the form of chips or raspings of a yellowish-white color.

Preparations: Extractum Quassiæ. Extractum Quassiæ Fluidum. Tinctura Quassiæ.

QUERCUS ALBA.

WHITE OAK.

The bark of *Quercus alba* Linné (nat. ord. *Cupuliferææ*).

In nearly flat pieces, deprived of the corky layer, about 5 Mm. thick; pale brown; inner surface with short, sharp, longitudinal ridges; tough; of a coarse, fibrous fracture, a faint, tan-like odor, and a strongly astringent taste.

As met with in the shops it is usually an irregularly coarse, fibrous powder, which does not tinge the saliva yellow.

QUILLAJA.

QUILLAJA.

[QUILLAIA, PHARM. 1880. SOAP BARK.]

The inner bark of *Quillaja Saponaria* Molina (nat. ord. *Rosacææ*).

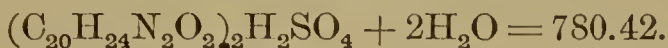
Flat, large pieces, about 5 Mm. thick; outer surface brownish-white, often with small patches of brown cork attached, otherwise smooth; inner surface whitish, smooth; fracture splintery, checkered with pale brownish bast-fibres imbedded in white tissue; inodorous; taste persistently acrid; the dust very sternutatory.

The infusion of Quillaja foams like soap-water.

Preparation: Tinctura Quillajæ.

QUINIDINÆ SULPHAS.

QUINIDINE SULPHATE.



The neutral sulphate of an alkaloid obtained from the bark of several species of *Cinchona* (nat. ord. *Rubiaceæ*).

Quinidine Sulphate should be kept in well-stoppered bottles, in a dark place.

White, silky needles, odorless, and having a very bitter taste; permanent in the air.

Soluble, at 15° C. (59° F.), in 100 parts of water, and in 8 parts of alcohol; in 7 parts of boiling water, and very soluble in boiling alcohol; also in 14 parts of chloroform, and in acidulated water; almost insoluble in ether.

When heated to 120° C. (248° F.), the salt loses its water of crystallization (4.6 per cent.). Upon ignition, it is slowly consumed, leaving no residue.

The salt is neutral or faintly alkaline to litmus paper.

An aqueous solution of the salt, when acidulated with sulphuric acid, has a decided, blue fluorescence.

On treating 10 Cc. of an aqueous solution (about 1 in 1600) of the salt with 2 drops of bromine water, and then with an excess of ammonia water, the liquid will acquire an emerald-green color. With proper adjustment of the reagents, more dilute solutions will give a paler tint, while more concentrated ones will acquire a deeper color, or deposit a green precipitate.

A cold, saturated aqueous solution of the salt yields a white precipitate with potassium iodide T.S. (difference from *quinine sulphate*).

An aqueous solution of the salt yields, with barium chloride T.S., a white precipitate insoluble in hydrochloric acid.

Quinidine Sulphate should not impart more than a faintly yellowish tint to concentrated sulphuric acid (limit of *readily carbonizable, organic impurities*), nor produce a red color with nitric acid (difference from *morphine*).

If a small quantity of ammonia water be added to 3 Cc. of an aqueous solution of the salt saturated at 15° C. (59° F.), a white precipitate (quinidine) will be produced, which requires more than 30 Cc. of ammonia or more than 30 times its weight of ether to dissolve it (absence of more than small proportions of *other cinchona alkaloids*).

QUININA.

QUININE.



An alkaloid obtained from the bark of various species of *Cinchona* (nat. ord. *Rubiaceæ*).

Quinine should be kept in well-stoppered bottles, in a dark place.

A white, flaky, amorphous or crystalline powder, odorless, and having a very bitter taste; permanent in the air.

Soluble, at 15° C. (59° F.), in 1670 parts of water, and in 6 parts of alcohol; in 760 parts of boiling water, and in 2 parts of boiling alcohol; in 23 parts of ether, 5 parts of chloroform, and 200 parts of glycerin; also soluble in carbon disulphide, benzin, benzol, ammonia water, and diluted acids.

When heated to about 57° C. (134.6° F.), it melts; at 100° C. (212° F.), it loses about 9 per cent. (or about 2 molecules) of its water of crystallization, the

remainder being expelled at 125° C. (257° F.). The anhydrous alkaloid, when pure, melts at 173° C. (343.4° F.). Upon ignition, it is consumed, leaving no residue.

Quinine has an alkaline reaction upon litmus paper.

A solution of Quinine in diluted sulphuric acid has a vivid, blue fluorescence.

On treating 10 Cc. of an aqueous, acidulated solution (about 1 in 1500) of quinine with 2 drops of bromine water, and then with an excess of ammonia water, the liquid will acquire an emerald-green color. With proper adjustment of the reagents, more dilute solutions will give a paler tint, while more concentrated ones will acquire a deeper color, or deposit a green precipitate.

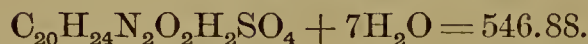
Quinine should not impart more than a faintly yellowish tint to concentrated sulphuric acid (limit of *readily carbonizable, organic impurities*), nor produce a red color with nitric acid (difference from *morphine*).

If 2 Gm. of Quinine be mixed, in a small mortar, with 1 Gm. of ammonium sulphate and 10 Cc. of distilled water, the mixture thoroughly dried on a water-bath, the residue (which should be strictly neutral to test-paper) agitated with 20 Cc. of water, then allowed to macerate for half an hour at 15° C. (59° F.), with occasional agitation, and filtered through a pellet of glass-wool, 5 Cc. of the filtrate, transferred to a test-tube, and gently mixed, without shaking, with 7 Cc. of ammonia water (specific gravity 0.960), should produce a clear liquid. If the temperature during the maceration has been 16° C. (60.8° F.), 7.5 Cc. of ammonia water may be added; if 17° C. (62.8° F.), 8 Cc. (In each case, a clear liquid indicates the absence of more than small proportions of *other cinchona alkaloids*.)

Preparations: Ferri et Quininæ Citras. Ferri et Quininæ Citras Solubilis.

QUININÆ BISULPHAS.

QUININE BISULPHATE.



Quinine Bisulphate should be kept in well-stoppered bottles, in a dark place.

Colorless, transparent or whitish, orthorhombic crystals, or small needles, odorless, and having a very bitter taste. Efflorescing on exposure to the air.

Soluble, at 15° C. (59° F.), in 10 parts of water, and in 32 parts of alcohol; very soluble in boiling water and in boiling alcohol.

When heated at 100° C. (212° F.), the salt loses all its water of crystallization (nearly 23 per cent.); at 135° C. (275° F.), it is converted into quinicine sulphate, which dissolves in diluted sulphuric acid with a yellow color without any blue fluorescence. On ignition, the salt is slowly consumed, leaving no residue.

The aqueous solution of the salt has a strongly acid reaction, and a blue fluorescence.

On treating 10 Cc. of an aqueous solution (about 1 in 1000) of the salt with 2 drops of bromine T.S., and then with an excess of ammonia water, the liquid will acquire an emerald-green color. With proper adjustment of the reagents, more dilute solutions will give a paler tint, while more concentrated ones will acquire a deeper color, or throw down a green precipitate.

Ammonia water added to the aqueous solution of the salt throws down a white precipitate, soluble in an excess of ammonia water, and also in about 20 times its weight of ether.

The aqueous solution of the salt yields, with barium chloride T.S., a white precipitate insoluble in hydrochloric acid.

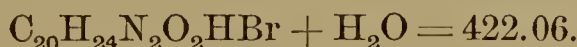
Quinine Bisulphate should not impart more than a faintly yellowish tint to concentrated sulphuric acid (limit of *readily carbonizable, organic impurities*).

If 1 Gm. of the salt be dried at a temperature of 100° C. (212° F.), until it ceases to lose weight, the remainder, cooled in a desiccator, should weigh not less than 0.77 Gm. (corresponding to 7 molecules, or 23 (22.98) per cent. of water of crystallization).

If 2 Gm. of the salt, dried at 100° C. (212° F.), be agitated with 16 Cc. of water, the mixture made exactly neutral with ammonia water, then brought to the volume of 20 Cc. by the addition of water, and macerated for half an hour at 15° C. (59° F.), upon proceeding further as directed for the corresponding test under Quinine (see *Quinina*) the results there given should be obtained.

QUININÆ HYDROBROMAS.

QUININE HYDROBROMATE.



Quinine Hydrobromate should be kept in well-stoppered bottles, in a dark place.

White, light, silky needles, odorless, and having a very bitter taste. The salt is liable to lose water on exposure to warm or dry air.

Soluble, at 15° C. (59° F.), in 54 parts of water, and in 0.6 part of alcohol; very soluble in boiling water and in boiling alcohol; also soluble in 6 parts of ether, and in 12 parts of chloroform.

When heated at 100° C. (212° F.), the salt loses its water of crystallization (4.25 per cent.). At 152° C. (305.6° F.), it begins to fuse, and becomes a syrupy liquid at 200° C. (392° F.). Upon ignition, it is slowly consumed, leaving no residue.

The salt is neutral or faintly alkaline to litmus paper.

An aqueous solution, when acidulated with sulphuric acid, has a vivid, blue fluorescence.

On treating 10 Cc. of an aqueous solution (about 1 in 1300) with 2 drops of bromine water, and then with an excess of ammonia water, the liquid will acquire an emerald-green color. With proper adjustment of the reagents, more dilute solutions will give a paler tint, while more concentrated ones will acquire a deeper color, or throw down a green precipitate.

Ammonia water added to the aqueous solution throws down a white precipitate, soluble in an excess of ammonia water, and also in about 20 times its weight of ether.

On precipitating a saturated aqueous solution of the salt with sodium hydrate T.S., filtering, supersaturating the filtrate with acetic acid, adding chloroform and a little chlorine water, and shaking, the chloroform will separate with a yellow color.

If 1 Gm. of the salt be dried at 100° C. (212° F.) until it ceases to lose weight, the residue should not weigh less than 0.957 Gm. (corresponding to 1 molecule, or 4.24 per cent., of water of crystallization).

Quinine Hydrobromate should not impart more than a faintly yellowish tint to concentrated sulphuric acid (limit of *readily carbonizable, organic impurities*), nor produce a red color with nitric acid (difference from *morphine*).

If 3 Gm. of the salt (which must have been previously ascertained to be strictly neutral, or have been rendered so) be mixed, in a small capsule, with 1.2 Gm. of crystallized sodium sulphate and 30 Cc. of water, the mixture thoroughly dried on a water-bath, the residue agitated with 30 Cc. of water, and allowed to macerate for half an hour at 15° C. (59° F.), with occasional agitation, upon proceeding further as directed under Quinine (see *Quinina*) the results there given should be obtained.

QUININÆ HYDROCHLORAS.

QUININE HYDROCHLORATE.



Quinine Hydrochlorate should be kept in well-stoppered bottles, in a dark place.

White, silky, light and fine, needle-shaped crystals, odorless, and having a very bitter taste. The salt is liable to lose water when exposed to warm air.

Soluble, at 15° C. (59° F.), in 34 parts of water, and in 3 parts of alcohol; in 1 part of boiling water, and very soluble in boiling alcohol; also soluble in 9 parts of chloroform.

When heated to 120° C. (248° F.), the salt loses its water of crystallization. At about 156° C. (312.8° F.), it begins to melt, but it is not fully melted until the temperature reaches 190° C. (374° F.). On ignition, it is slowly consumed, leaving no residue.

The aqueous solution of the salt is neutral or faintly alkaline to litmus paper.

The saturated aqueous solution of the salt does not give any blue fluorescence, which, however, appears to some extent upon diluting the solution with water, and markedly so upon addition of dilute sulphuric acid.

On treating 10 Cc. of an aqueous solution (about 1 in 1400) of the salt with 2 drops of bromine water, and then with an excess of ammonia water, the liquid will acquire an emerald-green color. With proper adjustment of the reagents, more dilute solutions will give a paler tint, while more concentrated ones will acquire a deeper color, or throw down a green precipitate.

Ammonia water added to the aqueous solution throws down a white precipitate, soluble in an excess of ammonia water, and also in about 20 times its weight of ether.

The aqueous solution of the salt yields, with silver nitrate T.S., a white precipitate insoluble in nitric acid.

If 1 Gm. of the salt be dried at 100° C. (212° F.) until it ceases to lose weight, the residue should not weigh less than 0.9 Gm. (corresponding to 2 molecules, or 9 per cent., of water of crystallization).

Quinine Hydrochlorate should not impart more than a faintly yellowish tint to concentrated sulphuric acid (limit of *readily carbonizable, organic impurities*), nor produce a red color with nitric acid (difference from *morphine*).

The aqueous solution of the salt should not be rendered turbid by diluted sulphuric acid (absence of *barium*), and should not be rendered more than slightly turbid by barium chloride T.S. (limit of *sulphate*).

If 3 Gm. of the salt (which must have been previously ascertained to be strictly neutral, or have been rendered so) be mixed, in a small capsule, with 1.5 Gm. of crystallized sodium sulphate and 30 Cc. of water, the mixture thoroughly dried on a water-bath, the residue agitated with 30 Cc. of water, and allowed to macerate for half an hour at 15° C. (59° F.), with occasional agitation, upon proceeding further as directed under Quinine (see *Quinina*) the results there given should be obtained.

QUININÆ SULPHAS.

QUININE SULPHATE.



Quinine Sulphate should be kept in well-stoppered bottles, in a dark place.

White, silky, light and fine, needle-shaped crystals, fragile and somewhat flexible, making a very light and easily compressible mass, lustreless from

superficial efflorescence after being for some time exposed to the air, odorless, and having a persistent, very bitter taste. The salt is liable to lose water on exposure to warm air, to absorb moisture in damp air, and to become colored by exposure to light.

Soluble, at 15° C. (59° F.), in 740 parts of water, and in 65 parts of alcohol; in 30 parts of boiling water, and in 3 parts of boiling alcohol; also in 40 parts of glycerin, in about 680 parts of chloroform, and freely in dilute acids.

When long exposed to the air, or when kept at 50° to 60° C. (122° to 140° F.) for some hours, it loses most of its water of crystallization (all except 2 to 3 molecules, or about 4.1 to 6.2 per cent.), the last portion being slowly expelled at 100° C. (212° F.), more rapidly at 115° C. (239° F.). Upon ignition, the salt is slowly consumed, leaving no residue.

The aqueous solution of the salt is neutral to litmus paper, and has, especially when acidulated with sulphuric acid, a vivid, blue fluorescence.

On treating 10 Cc. of an aqueous solution (about 1 in 1300) of the salt with 2 drops of bromine water, then with an excess of ammonia water, the liquid will acquire an emerald-green color. With proper adjustment of the reagents, more dilute solutions will give a paler tint, while more concentrated ones will acquire a deeper color, or throw down a green precipitate.

A cold, saturated aqueous solution of the salt remains unaffected by potassium iodide T.S. (difference from *quinidine sulphate*).

Ammonia water added to the aqueous solution of the salt throws down a white precipitate, soluble in an excess of ammonia water, and also in about 20 times its weight of ether.

The aqueous solution of the salt yields, with barium chloride T.S., a white precipitate insoluble in hydrochloric acid.

Quinine Sulphate should not impart more than a faintly yellowish tint to concentrated sulphuric acid (limit of *readily carbonizable, organic impurities*), nor produce a red color with nitric acid (difference from *morphine*).

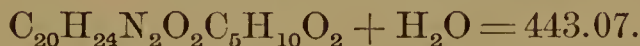
If 1 Gm. of the salt be dried at a temperature of 115° C. (239° F.), until it ceases to lose weight, the residue should not weigh less than 0.838 Gm. (absence of *more than eight (8) molecules*, or 16.18 per cent., of *water*).

If 2 Gm. of the salt (which must have been previously ascertained to be strictly neutral to litmus paper, or have been rendered so) be dried, as far as possible, at 100° C. (212° F.), the residue then agitated with 20 Cc. of water, and the mixture macerated for half an hour at 15° C. (59° F.), with occasional agitation, upon proceeding further as directed under Quinine (see *Quinina*) the results there given should be obtained.

Preparation: Syrupus Ferri, Quininæ et Strychninæ Phosphatum.

QUININÆ VALERIANAS.

QUININE VALERIANATE.



Quinine Valerianate should be kept in well-stoppered bottles, in a dark place.

White, or nearly white, pearly, lustrous, triclinic crystals, having a slight odor of valerianic acid, and a bitter taste. Permanent in the air.

Soluble, at 15° C. (59° F.), in 100 parts of water, and in 5 parts of alcohol; in 40 parts of boiling water, and in 1 part of boiling alcohol.

When heated to about 90° C. (194° F.), the salt melts, forming a colorless liquid. At 100° C. (212° F.), it loses its water of crystallization, and also begins to lose valerianic acid. On ignition, it is slowly consumed, leaving no residue.

The aqueous solution of the salt is neutral or slightly alkaline to litmus paper.

The aqueous solution, when acidulated with sulphuric acid, exhibits a blue fluorescence, and emits the odor of valerianic acid.

On treating 10 Cc. of an aqueous solution (about 1 in 1300) of the salt with 2 drops of bromine water, and then with an excess of ammonia water, the liquid will acquire an emerald-green color. With proper adjustment of the reagents, more dilute solutions will give a paler tint, while more concentrated ones will acquire a deeper color, or throw down a green precipitate.

Ammonia water added to the aqueous solution throws down a white precipitate, soluble in an excess of ammonia water, and also in about 20 times its weight of ether.

Quinine Valerianate should not impart more than a faintly yellowish tint to concentrated sulphuric acid (limit of *readily carbonizable, organic impurities*).

The aqueous solution of the salt should not be rendered more than slightly turbid by barium chloride T.S. (limit of *sulphate*).

RESINA.

RESIN.

[COLOPHONY.]

The residue left after distilling off the volatile oil from Turpentine.

A transparent, amber-colored substance, hard, brittle, pulverizable; fracture glossy and shallow-conchoidal; odor and taste faintly terebinthinate. Specific gravity 1.070 to 1.080.

Soluble in alcohol, ether, and fixed or volatile oils; also in solution of potassium or sodium hydrate.

Preparations: Ceratum Resinæ. Emplastrum Resinæ.

RESINA COPAIBÆ.

RESIN OF COPAIBA.

The residue left after distilling off the volatile oil from Copaiba.

A yellowish or brownish-yellow, brittle resin, having a slight odor and taste of copaiba.

Soluble in alcohol, ether, chloroform, carbon disulphide, benzol, or amylic alcohol.

RESINA JALAPÆ.

RESIN OF JALAP.

Jalap, in No. 60 powder, *one thousand grammes* 1000 Gm.

Alcohol,

Water, each, *a sufficient quantity*.

Moisten the powder with *three hundred* (300) *cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Al-

cohol, until *twenty-five hundred* (2500) *cubic centimeters* of tincture are obtained, or until the tincture ceases to produce more than a slight turbidity when dropped into water. Distil off the Alcohol, by means of a water-bath, until the tincture is reduced to *four hundred* (400) *grammes*, and add the latter, with constant stirring, to *nine thousand* (9000) *cubic centimeters* of Water. When the precipitate has subsided, decant the supernatant liquid, and wash the precipitate twice, by decantation, with fresh portions of Water. Place it upon a strainer, and, having pressed out the liquid, dry the Resin with a gentle heat, stirring occasionally until the moisture has evaporated.

Yellowish-brown, or brown masses or fragments, breaking with a resinous, glossy fracture, translucent at the edges, or a yellowish-gray or yellowish-brown powder, having a slight, peculiar odor, and a somewhat acrid taste. Permanent in the air.

Its alcoholic solution has a faintly acid reaction.

Soluble in alcohol in all proportions; insoluble in carbon disulphide, benzol, and fixed or volatile oils. Not more than about 10 per cent. of it is soluble in ether.

On evaporating the ethereal solution, and dissolving the residue in potassium hydrate T.S., a reddish-brown liquid is formed, from which the resin is reprecipitated by acids. If that portion of Resin of Jalap which remained undissolved by ether be dissolved in potassium hydrate T.S., the addition of an acid does not precipitate it.

Resin of Jalap should not suffer any material loss of weight when heated at 100° C. (212° F.) (absence of *water*).

Water triturated with it should neither become colored, nor take up anything soluble from it (absence of *soluble impurities*).

On digesting 1 Gm. of Resin of Jalap for about an hour, with frequent agitation, in a glass-stoppered vial, with 10 Cc. of ammonia water, at a temperature of about 80° C. (176° F.), it should yield a solution which does not gelatinize on cooling (absence of *common resin*).

RESINA PODOPHYLLI.

RESIN OF PODOPHYLLUM.

Podophyllum, in No. 60 powder, *one thousand grammes* . . . 1000 Gm.

Hydrochloric Acid, *ten cubic centimeters* 10 Cc.

Alcohol,

Water, each, *a sufficient quantity*.

Moisten the powder with *four hundred and eighty* (480) *cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then add enough Alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding Alcohol, until *sixteen hundred* (1600) *cubic centimeters* of tincture are obtained, or until the tincture ceases to produce more than a slight turbidity when dropped into water. Distil off the Alcohol, by

means of a water-bath, until the tincture is reduced to a syrupy consistence, and pour it slowly, with constant stirring, into *one thousand* (1000) *cubic centimeters* of Water, previously cooled to a temperature below 10° C. (50° F.), and mixed with the Hydrochloric Acid. When the precipitate has subsided, decant the supernatant liquid, and wash the precipitate twice, by decantation, with fresh portions of cold Water. Spread it, in a thin layer, upon a strainer, and dry the Resin by exposure to the air, in a cool place. Should it coalesce during the drying, or aggregate into lumps having a varnish-like surface, it should be removed, broken in pieces, and rubbed in a mortar. As this is liable to happen during warm weather, Resin of Podophyllum is preferably made during the cold season.

An amorphous powder, varying in color from grayish-white to pale greenish-yellow or yellowish-green, turning darker when exposed to a heat over 35° C. (95° F.); having a slight, peculiar odor, and a peculiar, faintly bitter taste. Permanent in the air.

Its alcoholic solution has a faintly acid reaction.

Soluble in alcohol in all proportions; ether dissolves 15 to 20 per cent. of it; boiling water dissolves about 80 per cent., and deposits most of it again on cooling, the remaining, clear aqueous solution having a bitter taste, and turning brown on the addition of ferric chloride T.S.

Resin of Podophyllum is also soluble in potassium or sodium hydrate T.S., forming a deep yellow liquid, which gradually becomes darker, and from which the resin is reprecipitated by acids.

Preparation: Pilulæ Catharticæ Vegetabiles.

RESINA SCAMMONII.

RESIN OF SCAMMONY.

Scammony, in No. 60 powder, *one thousand grammes*. . . . 1000 Gm.

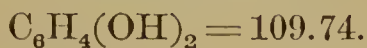
Alcohol,

Water, each, *a sufficient quantity*.

Digest the Scammony with successive portions of boiling Alcohol until it is exhausted. Mix the tinctures, and reduce the mixture to a syrupy consistence by distilling off the Alcohol. Then add the residue in a thin stream, with active stirring, to *twenty-five hundred* (2500) *cubic centimeters* of Water, separate the precipitate formed, wash it thoroughly with Water, and dry it with a gentle heat.

Yellowish-brown or brownish-yellow masses or fragments, breaking with a glossy, resinous fracture, translucent at the edges; or a yellowish-white or grayish-white powder, having a faint, peculiar odor, and a slight, peculiar taste.

Soluble in alcohol in all proportions; also wholly soluble in ether and in oil of turpentine. Ammonia water and solutions of alkalies dissolve it with the aid of a gentle heat; from these solutions the resin is not reprecipitated by acids.

RESORCINUM.**RESORCIN.**

[RESORCINOL. METADIOXYBENZOL.]

A diatomic phenol.

Resorcin should be kept in dark amber-colored vials.

Colorless or faintly reddish, needle-shaped crystals or rhombic plates, having a faint, peculiar odor, and a disagreeable, sweetish and afterwards pungent taste. Resorcin acquires a reddish or brownish tint by exposure to light and air.

Soluble, at 15° C. (59° F.), in 0.6 part of water, and in 0.5 part of alcohol; very soluble in boiling water, or in boiling alcohol; also readily soluble in ether or glycerin; very slightly soluble in chloroform.

When heated to a temperature between 110° and 119° C. (230° and 246.2° F.), Resorcin melts, a higher melting point indicating a greater degree of purity. At a higher heat it is completely volatilized.

The aqueous solution is neutral or only faintly acid to litmus paper.

On adding a few drops of ferric chloride T.S. to 10 Cc. of a dilute aqueous solution (1 in 200) of Resorcin, the liquid assumes a bluish-violet color.

If 0.1 Gm. of Resorcin be dissolved in 1 Cc. of potassium hydrate T.S. and a drop of chloroform added, the mixture, upon being heated, will assume an intense, crimson color. If a slight excess of hydrochloric acid be then added, the color will change to a pale straw-yellow.

On cautiously heating 0.05 Gm. of Resorcin with 0.1 Gm. of tartaric acid and 10 drops of concentrated sulphuric acid, a thick, carmine-red liquid will be formed, becoming pale yellow when diluted with water.

A concentrated aqueous solution (1 in 2) of Resorcin should be colorless (absence of *empyreumatic bodies*), and when gently heated should not emit the odor of *phenol*.

RHAMNUS PURSHIANA.**CASCARA SAGRADA.**

The bark of *Rhamnus Purshiana* De Candolle (nat. ord. *Rhamnaceæ*).

In quills or curved pieces, about 3 to 10 Cm. long, and about 2 Mm. thick; outer surface brownish-gray and whitish; the young bark having numerous, rather broad, pale-colored warts; inner surface yellowish to light brownish, becoming dark brown by age; smooth or finely striate; fracture short, yellowish, in the inner layer of thick bark somewhat fibrous; inodorous; taste bitter.

Preparation: Extractum Rhamni Purshianæ Fluidum.

RHEUM.**RHUBARB.**

The root of *Rheum officinale* Baillon (nat. ord. *Polygonaceæ*).

In cylindrical, conical or flattish segments, deprived of the dark brown, corky layer, smoothish or somewhat wrinkled, externally covered with a bright yellowish-brown powder, marked with white, elongated meshes, containing a white, rather spongy tissue, and a number of short, reddish-brown

or brownish-yellow striae; compact, hard; fracture uneven; internally white, with numerous red, irregularly-curved and interrupted medullary rays, which are radially parallel only near the cambium line; odor somewhat peculiar, aromatic; taste bitter, somewhat astringent.

When chewed, Rhubarb feels gritty between the teeth, and imparts a yellow color to the saliva.

Rhubarb which is very porous, or has a prominently mucilaginous taste, or is of a dark brown color internally, should be rejected.

Preparations: Extractum Rhei. Extractum Rhei Fluidum. Pilulæ Rhei. Pilulæ Rhei Compositæ. Pulvis Rhei Compositus. Tinctura Rhei. Tinctura Rhei Aromatica. Tinctura Rhei Dulcis.

RHUS GLABRA.

RHUS GLABRA.

The fruit of *Rhus glabra* Linné (nat. ord. *Anacardiæ*).

Subglobular, about 3 Mm. in diameter, drupaceous, crimson, densely hairy, containing a roundish-oblong, smooth putamen; inodorous; taste acidulous.

Preparation: Extractum Rhois Glabræ Fluidum.

RHUS TOXICODENDRON.

RHUS TOXICODENDRON.

[POISON IVY.]

The fresh leaves of *Rhus radicans* Linné (nat. ord. *Anacardiæ*).

Long-petiolate, trifoliolate; the lateral leaflets sessile or nearly so, about 10 Cm. long, obliquely ovate, pointed; the terminal leaflets stalked, ovate or oval, pointed, with a wedge-shaped or rounded base; the leaflets entire and glabrous, or variously notched, coarsely toothed or lobed, more or less downy; when dry, papery and brittle; inodorous; taste somewhat astringent and acrid.

The fresh leaves abound with an acrid juice, which darkens when exposed to the air, and, when applied to the skin, produces inflammation and swelling. The leaves should, therefore, not be touched with bare hands.

Rhus Toxicodendron should not be confounded with the leaves of *Ptelea trifoliata* Linné (nat. ord. *Rutaceæ*), which are similar in appearance, but have all the leaflets sessile.

ROSA CENTIFOLIA.

PALE ROSE.

The petals of *Rosa centifolia* Linné (nat. ord. *Rosaceæ*).

Roundish-obovate and retuse, or obcordate, pink, fragrant, sweetish, slightly bitter and faintly astringent.

ROSA GALLICA.

RED ROSE.

The petals of *Rosa gallica* Linné (nat. ord. *Rosaceæ*), collected before expanding.

Usually in small cones, consisting of numerous imbricated, roundish, retuse, deep purple-colored, yellow-clawed petals, having a roseate odor and a bitterish, slightly acidulous and distinctly astringent taste.

Preparations: Confectio Rosæ. Extractum Rosæ Fluidum. Pilulæ Aloes et Mastiches.

RUBUS.

RUBUS.

[BLACKBERRY.]

The bark of the root of *Rubus villosus* Aiton, *Rubus canadensis* Linné, and *Rubus trivialis* Michaux (nat. ord. *Rosaceæ*).

In thin, tough, flexible bands, outer surface blackish or blackish-gray, inner surface pale brownish, sometimes with strips of whitish, tasteless wood adhering; inodorous; taste strongly astringent, somewhat bitter.

Preparation: Extractum Rubi Fluidum.

RUBUS IDÆUS.

RASPBERRY.

The fruit of *Rubus idæus* Linné (nat. ord. *Rosaceæ*).

Deprived of the conical receptacle, and therefore hollow at the base; hemispherical, red, finely hairy, composed of from twenty to thirty coalesced, small drupes, each one crowned with the withered style; juice red; of an agreeable odor, and a pleasant, acidulous taste.

The closely allied, light red fruit of *Rubus strigosus* Michaux, and the purplish-black fruit of *Rubus occidentalis* Linné, may be employed in place of the above.

Preparation: Syrupus Rubi Idæi.

RUMEX.

RUMEX.

[YELLOW DOCK.]

The root of *Rumex crispus* Linné, and of some other species of *Rumex* (nat. ord. *Polygonaceæ*).

From 20 to 30 Cm. long, about 10 to 15 Mm. thick, somewhat fusiform, fleshy, nearly simple, annulate above, deeply wrinkled below; externally rusty brown, internally whitish, with fine, straight, interrupted, reddish, medullary rays, and a rather thick bark; fracture short; odor slight, peculiar; taste bitter and astringent.

Preparation: Extractum Rumicis Fluidum.

SABINA.

SAVINE.

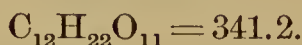
The tops of *Juniperus Sabina* Linné (nat. ord. *Coniferae*).

Short, thin, subquadrangular branchlets; leaves rather dark green, in four rows, opposite, scale-like, ovate-lanceolate, more or less acute, appressed, imbricated, on the back with a shallow groove containing an oblong or roundish gland; odor peculiar, terebinthinate; taste nauseous, resinous, and bitter.

Preparation: Extractum Sabinæ Fluidum.

SACCHARUM.

SUGAR.



[CANE SUGAR.]

The refined sugar obtained from *Saccharum officinarum* Linné, and from various species or varieties of *Sorghum* (nat. ord. *Gramineæ*); also from one or more varieties of *Beta vulgaris* Linné (nat. ord. *Chenopodiaceæ*).

White, dry, hard, distinctly crystalline granules, odorless, and having a purely sweet taste. Permanent in the air.

Soluble, at 15° C. (59° F.), in 0.5 part of water, and in 175 parts of alcohol; in 0.2 part of boiling water, and in 28 parts of boiling alcohol; also soluble in 80 parts of boiling, absolute alcohol, but insoluble in ether, chloroform, or carbon disulphide.

The aqueous solution, saturated at 15° C. (59° F.), has the specific gravity 1.345, and is miscible with water in all proportions.

The aqueous or alcoholic solution of Sugar is neutral to litmus paper.

Both the aqueous and the alcoholic solution of Sugar should be clear and transparent. When kept in large, well-closed and completely filled bottles, the solutions should not deposit a sediment on prolonged standing (absence of insoluble salts, ultramarine, Prussian blue, etc.).

If 1 Gm. of Sugar be dissolved in 10 Cc. of boiling water, the solution mixed with 4 or 5 drops of silver nitrate T.S., then about 2 Cc. of ammonia water added, and the liquid quickly brought to the boiling point, not more than a slight coloration, but no black precipitate, should appear in the liquid after standing at rest for five minutes (absence of grape-sugar, or of more than a slight amount of inverted sugar).

Preparations: Syrupus. (Compound Syrups, etc.).

SACCHARUM LACTIS.

SUGAR OF MILK.



A peculiar, crystalline sugar, obtained from the whey of cow's milk by evaporation, and purified by recrystallization.

White, hard, crystalline masses, yielding a white powder feeling gritty on the tongue, odorless, and having a faintly sweet taste. Permanent in the air.

Soluble in about 6 parts of water at 15° C. (59° F.), and in 1 part of boiling water; insoluble in alcohol, ether, or chloroform.

The aqueous solution of Sugar of Milk is neutral to litmus paper.

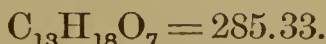
On adding to a few Cc. of a hot, saturated aqueous solution of Sugar of Milk an equal volume of sodium hydrate T.S., and gently warming, the liquid

will turn yellow and brownish-red. On the further addition of a few drops of copper sulphate T.S., a brick-red precipitate will appear.

If about 1 Gm. of powdered Sugar of Milk be sprinkled upon about 5 Cc. of cold sulphuric acid contained in a flat-bottomed capsule, the acid may acquire a greenish or reddish but no brown or brownish-black color within half an hour (absence of *cane-sugar*).

SALICINUM.

SALICIN.



A neutral principle obtained from several species of *Salix* and *Populus* (nat. ord. *Salicaceæ*).

Colorless, or white, silky, shining crystalline needles, or a crystalline powder, odorless, and having a very bitter taste. Permanent in the air.

Soluble, at 15° C. (59° F.), in 28 parts of water, and in 30 parts of alcohol; in 0.7 part of boiling water, and in 2 parts of boiling alcohol; almost insoluble in ether or chloroform.

When heated to 198° C. (388.4° F.), Salicin melts, yielding a colorless liquid which, on cooling, congeals to a crystalline mass. Upon ignition, it is consumed, leaving no residue.

Salicin is neutral to litmus paper.

On heating a small portion of Salicin, in a test-tube, until it turns brown, then adding a few Cc. of water, and afterwards a drop of ferric chloride T.S., a violet color will be produced.

Cold, concentrated sulphuric acid dissolves Salicin with a red color; the solution, after the addition of water, becomes colorless, and deposits a dark-red powder insoluble in water or alcohol.

On heating a small portion of Salicin with 1 Cc. of potassium dichromate T.S. and 2 Cc. of sulphuric acid, the odor of salicylic aldehyde (or of oil of meadow-sweet, *Spiræa ulmaria* Linné, nat. ord. *Rosaceæ*) will become noticeable.

The aqueous solution of Salicin is not precipitated by tannic or picric acid, nor by mercuric potassium iodide T.S. (absence of, and difference from, *alkaloids*).

SALOL.

SALOL.



[PHENYL SALICYLATE.]

The salicylic ether of phenol.

A white, crystalline powder, odorless, or having a faintly aromatic odor, and almost tasteless. Permanent in the air.

Almost insoluble in water; soluble in 10 parts of alcohol at 15° C. (59° F.); very soluble in boiling alcohol; also soluble in 0.3 part of ether, and readily in chloroform, and in fixed or volatile oils.

When heated to 42°–43° C. (107.6°–109.4° F.), Salol melts. When heated on platinum, it takes fire, and is consumed, leaving no residue.

Salol is neutral to litmus paper moistened with alcohol.

On warming a small portion of Salol with enough sodium hydrate T.S. to dissolve it, and then supersaturating the liquid with hydrochloric acid, salicylic acid will separate, and the odor of phenol will become perceptible.

In an alcoholic solution of Salol, bromine water, added in excess, produces a white precipitate.

On adding a few drops of dilute ferric chloride T.S., made by diluting the test-solution with 20 volumes of water, to 10 Cc. of an alcoholic solution (1 in 50) of Salol, the liquid will acquire a violet tint. If, however, a few drops of the alcoholic solution of Salol be added to 10 Cc. of the diluted ferric chloride T.S., a whitish cloudiness, but no color, will be produced on shaking.

On shaking 1 Gm. of Salol with 50 Cc. of water, the filtrate should not be affected by ferric chloride T.S. previously diluted with 20 volumes of water (absence of *uncombined carbolic* or *salicylic acid*); nor by barium chloride T.S. (absence of *sulphate* or *phosphate*); nor by silver nitrate T.S. (absence of *chloride*).

SALVIA.

SALVIA.

[SAGE.]

The leaves of *Salvia officinalis* Linné (nat. ord. *Labiatae*).

About 5 Cm. long, petiolate, ovate-oblong, obtuse or subacute at the apex, rounded or somewhat heart-shaped at the base, finely crenulate, thickish, wrinkled, grayish-green, soft-hairy and glandular beneath; odor aromatic; taste aromatic, bitterish, and somewhat astringent.

SAMBUCUS.

SAMBUCUS.

[ELDER.]

The flowers of *Sambucus canadensis* Linné (nat. ord. *Caprifoliaceae*).

The flowers, when fresh, about 5 Mm. broad, and after drying shrivelled; calyx superior, minutely five-toothed; corolla originally cream-colored, after drying pale brownish-yellow, wheel-shaped and five-lobed, with five stamens on the short tube; odor peculiar; taste sweetish, somewhat aromatic and bitterish.

The peduncles and pedicels of the inflorescence should be rejected.

SANGUINARIA.

SANGUINARIA.

[BLOODROOT.]

The rhizome of *Sanguinaria canadensis* Linné (nat. ord. *Papaveraceae*), collected in autumn.

Of horizontal growth, about 5 Cm. long, and 1 Cm. thick, cylindrical, somewhat branched, faintly annulate, wrinkled, reddish-brown; fracture short, somewhat waxy, whitish, with numerous small, red resin-cells, or of a nearly uniform, brownish-red color; bark thin; odor slight; taste persistently bitter and acrid.

Preparations: Extractum Sanguinariae Fluidum. Tinctura Sanguinariae.

SANTALUM RUBRUM.**RED SAUNDERS.**

The wood of *Pterocarpus santalinus* Linné filius (nat. ord. *Leguminosæ*).

A hard, heavy, dark reddish-brown, coarsely splintery wood, deprived of the light-colored sap-wood ; usually met with in chips, or as a coarse, irregular, brownish-red powder, nearly inodorous and nearly tasteless.

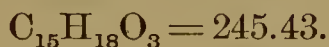
Red Saunders does not impart any red color to water when macerated with it.

SANTONICA.**SANTONICA.**

[LEVANT WORMSEED.]

The unexpanded flower-heads of *Artemisia pauciflora* Weber (nat. ord. *Compositæ*).

From 2 to 4 Mm. long, oblong-ovoid, obtuse, smooth, somewhat glossy, grayish-green, after exposure to light brownish-green, consisting of an involucre of about 12 to 18 closely imbricated, glandular scales with a broad midrib, enclosing four or five rudimentary florets ; odor strong, peculiar, somewhat camphoraceous ; taste aromatic and bitter.

SANTONINUM.**SANTONIN.**

A neutral principle obtained from Santonica.

Santonin should be kept in dark amber-colored vials, and should not be exposed to light.

Colorless, shining, flattened, prismatic crystals, odorless and nearly tasteless when first put in the mouth, but afterwards developing a bitter taste ; not altered by exposure to air, but turning yellow on exposure to light.

Nearly insoluble in cold water ; soluble in 40 parts of alcohol at 15° C. (59° F.), in 250 parts of boiling water, and in 3 parts of boiling alcohol ; also soluble in 140 parts of ether, in 4 parts of chloroform, and in solutions of caustic alkalies.

When heated to 170° C. (338° F.), Santonin melts, and forms, if rapidly cooled, an amorphous mass, which instantly crystallizes on coming in contact with a minute quantity of one of its solvents. At a higher temperature it sublimes, partly unchanged, and, when ignited, it is consumed, leaving no residue.

Santonin is neutral to litmus paper moistened with alcohol.

Santonin yields, with an alcoholic solution of potassium hydrate, a bright pinkish-red liquid which gradually becomes colorless.

From its solution in caustic alkalies, Santonin is completely precipitated by supersaturation with an acid.

Its solution in cold, concentrated sulphuric acid is at first colorless (absence of *easily carbonizable, organic substances*), but after some time turns yellow, then red, and finally brown. If water be added, immediately after it is dissolved without color in sulphuric acid, it will be completely precipitated, and the

supernatant liquid should not have a bitter taste, nor should it be altered upon the addition of potassium dichromate T.S. (absence of *brucine* or *strychnine*), or of mercuric potassium iodide T.S. (absence of *alkaloids in general*).

Preparation: Trochisci Santonini.

SAPO.

SOAP.

[WHITE CASTILE SOAP.]

Soap prepared from soda and olive oil.

A white or whitish solid, hard, yet easily cut when fresh, having a faint, peculiar odor free from rancidity, a disagreeable, alkaline taste, and an alkaline reaction.

Soluble in water and in alcohol, more readily with the aid of heat.

On placing a small, weighed portion of Soap, together with about 10 Cc. of alcohol, in a tared beaker containing sand, evaporating the resulting solution of the Soap to dryness, and drying the residue at 110° C. (230° F.), the loss of weight should not exceed 36 per cent. (absence of an undue amount of *water*).

A 4-per-cent. alcoholic solution of Soap should not gelatinize on cooling (absence of *animal fats*).

An aqueous solution of Soap should remain unaffected on the addition of hydrogen sulphide or ammonium sulphide T.S. (absence of *metallic impurities*).

On dissolving 20 Gm. of Soap in alcohol, with the aid of heat, transferring the undissolved residue, if any, to a filter, and washing it thoroughly with boiling alcohol, it should, after drying, weigh not more than 0.6 Gm. (limit of *sodium carbonate*, etc.); and at least 0.4 Gm. of this residue should be soluble in water (limit of *silica* and *other accidental impurities*).

If a solution of 5 Gm. of Soap in 50 Cc. of water be mixed with 3 Cc. of decinormal oxalic acid V.S., the subsequent addition of a few drops of phenolphthalein T.S. should produce no pink or red tint (limit of *alkalinity*).

Preparations: Emplastrum Saponis. Linimentum Saponis.

SAPO MOLLIS.

SOFT SOAP.

[SAPO VIRIDIS, PHARM. 1880. GREEN SOAP.]

Linseed Oil, <i>four hundred grammes</i>	400 Gm.
Potassa, <i>ninety grammes</i>	90 Gm.
Alcohol, <i>forty cubic centimeters</i>	40 Cc.
Water, <i>a sufficient quantity</i> .	

Heat the Linseed Oil in a deep, capacious vessel, on a water-bath or steam-bath, to a temperature of about 60° C. (140° F.). Dissolve the Potassa in *four hundred and fifty* (450) *cubic centimeters* of Water, add the Alcohol, and then gradually add the mixture, constantly stirring, to the Oil, continuing the heat until a small portion of the mixture is found to be soluble in boiling Water without the separation of oily drops. Then allow the mixture to cool, and transfer it to suitable vessels.

The Potassa used in this process should be of the full strength directed by the Pharmacopœia (90 per cent.). Potassa of any other strength, however, may be used, if a proportionately larger or smaller quantity be taken, the proper amount for the above formula being ascertained by dividing 8100 by the percentage of absolute Potassa (potassium hydrate) contained therein.

A soft, unctuous mass, of a yellowish-brown or brownish-yellow color.

Soluble in about 5 parts of hot water to a nearly clear liquid; also in 2 parts of hot alcohol without leaving more than 3 per cent. of insoluble residue.

Preparation: Linimentum Saponis Mollis.

SARSAPARILLA.

SARSAPARILLA.

The root of *Smilax officinalis* Kunth, *Smilax medica* Chamisso et Schlechtendal, *Smilax papyracea* Duhamel, and of other, undetermined species of *Smilax* (nat. ord. *Liliaceæ*).

About 4 or 5 Mm. thick, very long, cylindrical, longitudinally wrinkled, externally grayish-brown or orange-brown; internally showing a whitish and mealy, or somewhat horny, cortical layer, surrounding a circular wood-zone, the latter enclosing a broad pith; nearly inodorous; taste mucilaginous, bitterish, and acrid.

The thick, woody, knotty rhizome, if present, should be removed.

Preparations: Decoctum Sarsaparillæ Compositum. Extractum Sarsaparillæ Fluidum. Extractum Sarsaparillæ Fluidum Compositum.

SASSAFRAS.

SASSAFRAS.

The bark of the root of *Sassafras variifolium* (Salisbury) O. Kuntze (nat. ord. *Laurineæ*).

In irregular fragments, deprived of the gray, corky layer; bright rust-brown, soft, fragile, with a short, corky fracture; the inner surface smooth; strongly fragrant; taste sweetish, aromatic, and somewhat astringent.

SASSAFRAS MEDULLA.

SASSAFRAS PITH.

The pith of *Sassafras variifolium* (Salisbury) O. Kuntze (nat. ord. *Laurineæ*).

In slender, cylindrical pieces, often curved or coiled, light, spongy, white, inodorous, and insipid.

Macerated in water it forms a mucilaginous liquid, which is not precipitated on the addition of alcohol.

Preparation: Mucilago Sassafras Medullæ.

SCAMMONIUM.

SCAMMONY.

A resinous exudation from the living root of *Convolvulus Scammonia* Linné (nat. ord. *Convolvulaceæ*).

In irregular, angular pieces or circular cakes, greenish-gray or blackish, internally porous, and breaking with an angular fracture, of a resinous lustre; odor peculiar, somewhat cheese-like; taste slightly acrid; powder gray or greenish-gray.

When triturated with water, Scammony yields a greenish emulsion; it does not effervesce on the addition of diluted hydrochloric acid, and the decoction, when cold, does not assume a blue color on the addition of iodine T.S. (absence of starch).

Ether dissolves at least 75 per cent. of it; and, when the ether has been evaporated, the residue, dissolved in hot solution of potassium hydrate, is not reprecipitated by diluted sulphuric acid.

Preparation: Resina Scammonii.

SCILLA.

SQUILL.

The bulb of *Urginea maritima* (Linné) Baker (nat. ord. *Liliaceæ*), deprived of its dry, membranaceous outer scales, and cut into thin slices, the central portions being rejected.

In narrow segments, about 5 Cm. long, slightly translucent, yellowish-white or reddish, brittle and pulverizable when dry, tough and flexible after exposure to damp air; inodorous; taste mucilaginous, bitter, and acrid.

Preparations: Acetum Scillæ. Extractum Scillæ Fluidum. Tinctura Scillæ.

SCOPARIUS.

SCOPARIUS.

[BROOM.]

The tops of *Cytisus Scoparius* (Linné) Link (nat. ord. *Leguminosæ*).

In thin, flexible, branched twigs, pentangular, winged, dark green, nearly smooth, tough, usually free from leaves; odor peculiar when bruised; taste disagreeably bitter.

Preparation: Extractum Scoparii Fluidum.

SCUTELLARIA.

SCUTELLARIA.

[SCULLCAP.]

The herb of *Scutellaria lateriflora* Linné (nat. ord. *Labiataæ*).

About 50 Cm. long, smooth; stem quadrangular, branched; leaves opposite, petiolate, about 5 Cm. long, ovate-lanceolate or ovate-oblong, serrate; flowers

in axillary, one-sided racemes, with a pale blue corolla and bilabiate calyx, closed in fruit, the upper lip helmet-shaped ; odor slight ; taste bitterish.

Preparation : Extractum Scutellariæ Fluidum.

SENEGA.

SENEGA.

The root of *Polygala Senega* Linné (nat. ord. *Polygaleæ*).

About 10 Cm. long, with a very knotty crown, and spreading, tortuous branches, keeled when dry, fleshy and round after having been soaked in water ; externally yellowish-gray or brownish-yellow ; bark thick, whitish within, enclosing an irregular, porous, yellowish wood ; odor slight, but unpleasant ; taste sweetish, afterwards acrid.

Preparation : Extractum Senegæ Fluidum.

SENNA.

SENNA.

The leaflets of *Cassia acutifolia* Delile (Alexandria Senna), and of *Cassia angustifolia* Vahl (India Senna) ; (nat. ord. *Leguminosæ*).

Alexandria Senna consists of leaflets about 25 Mm. long and 10 Mm. broad, lanceolate, or lance-oval, subcoriaceous, brittle, rather pointed, unequally oblique at the base, entire, grayish-green, somewhat pubescent, of a peculiar odor, and a nauseous, bitter taste.

It should be free from stalks, and from Argel leaves (the leaves of *Solenostemma Argel* Hayne, nat. ord. *Asclepiadææ*), which are frequently present ; these leaves are thicker, one-veined, wrinkled, glaucous, and even at the base.

India Senna consists of leaflets from 3 to 5 Cm. long, and 10 to 15 Mm. broad ; lanceolate, acute, unequally oblique at the base, entire, thin, yellowish-green or dull green, nearly smooth ; odor peculiar, somewhat tea-like ; taste mucilaginous, bitter, and nauseous.

It should be free from stalks, discolored leaves, and other admixtures.

Preparations : Confectio Sennæ. Extractum Sennæ Fluidum. Infusum Sennæ Compositum. Pulvis Glycyrrhizæ Compositus. Syrupus Sennæ.

SERPENTARIA.

SERPENTARIA.

[VIRGINIA SNAKEROOT.]

The rhizome and roots of *Aristolochia Serpentaria* Linné, and of *Aristolochia reticulata* Nuttall (nat. ord. *Aristolochiaceæ*).

The rhizome is about 25 Mm. long, thin, bent ; on the upper side with approximate, short stem-bases ; on the lower side with numerous, thin, branching roots about 10 Cm. long ; dull yellowish-brown, internally whitish ; the wood-rays of the rhizome longest on the lower side ; odor aromatic, camphoraceous ; taste warm, bitterish, and camphoraceous.

The roots of *Aristolochia reticulata* are coarser, longer, and less interlaced than those of *Aristolochia Serpentaria*.

Preparations : Extractum Serpentariæ Fluidum. Tinctura Cinchonæ Composita. Tinctura Serpentariæ.

SEVUM.**SUET.**

[MUTTON SUET.]

The internal fat of the abdomen of *Ovis Aries* Linné (class *Mammalia*; order *Ruminantia*), purified by melting and straining.

Suet should be kept in well-closed vessels impervious to fat. It should not be used after it has become rancid.

A white, solid fat, nearly inodorous, and having a bland taste when fresh, but becoming rancid on prolonged exposure to the air.

Insoluble in water or cold alcohol; soluble in 44 parts of boiling alcohol, in about 60 parts of ether, and slowly in 2 parts of benzin. From its solution in the latter, kept in a stoppered flask, it slowly separates in a crystalline form on standing.

An alcoholic solution of Suet is neutral or has only a slightly acid reaction to litmus paper moistened with alcohol.

Suet melts between 45° and 50° C. (113° and 122° F.), and congeals between 37° and 40° C. (98.6° and 104° F.).

SINAPIS ALBA.**WHITE MUSTARD.**

The seed of *Brassica alba* (Linné) Hooker filius et Thompson (nat. ord. *Cruciferae*).

About 2 Mm. in diameter, almost globular, with a circular hilum; testa yellowish, finely pitted, hard; embryo oily, with a curved radicle, and two cotyledons, one folded over the other; free from starch; inodorous; taste pungent and acrid.

SINAPIS NIGRA.**BLACK MUSTARD.**

The seed of *Brassica nigra* (Linné) Koch (nat. ord. *Cruciferae*).

About 1 Mm. in diameter, almost globular, with a circular hilum; testa blackish-brown or grayish-brown, finely pitted, hard; embryo oily, with a curved radicle, and two cotyledons, one folded over the other; free from starch; inodorous when dry, but when triturated with water, of a pungent, penetrating, irritating odor; taste pungent and acrid.

Preparation: Charta Sinapis.

SODA.**SODA.**

NaOH = 39.96.

[SODIUM HYDRATE. SODIUM HYDROXIDE. CAUSTIC SODA.]

Soda should be kept in well-stoppered bottles made of hard glass.

Dry, white, translucent pencils, or fused masses, showing a crystalline fracture, odorless, and having an acrid and caustic taste. Great caution is neces-

sary in tasting and handling it, as it rapidly destroys organic tissues. Exposed to the air, it rapidly deliquesces, absorbs carbon dioxide, and becomes covered with a dry coating of carbonate.

Soluble in 1.7 parts of water at 15° C. (59° F.), and in 0.8 part of boiling water; very soluble in alcohol.

When heated to about 525° C. (977° F.), Soda melts to a clear, oily liquid, and at a bright red heat it is slowly volatilized unchanged. When introduced into a non-luminous flame, it imparts to it an intense, yellow color.

A solution of Soda, even when greatly diluted, gives a strongly alkaline reaction with litmus paper.

The aqueous solution (1 in 20) should be perfectly clear and colorless (absence of *organic matter*), and, after being acidulated with acetic acid, separate portions of it should yield no precipitate on the addition of platinic chloride T.S., or sodium cobaltic nitrite T.S., or excess of tartaric acid T.S. (limit of *potassium*).

If 1 Gm. of Soda be dissolved in 10 Cc. of water and the solution slightly supersaturated with acetic acid, 10 Cc. of the solution should not be colored or rendered turbid by the addition of an equal volume of hydrogen sulphide T.S. (absence of *arsenic, copper, lead, etc.*), nor by the subsequent addition of ammonia water in slight excess (absence of *iron, aluminum, etc.*).

The remainder of the acidulated solution should not be rendered turbid by ammonium oxalate T.S. (absence of *calcium*).

If a solution of 1.2 Gm. of Soda in 10 Cc. of water be slightly supersaturated with nitric acid, then 0.5 Cc. of decinormal silver nitrate V.S. added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of silver nitrate V.S. (limit of *chloride*).

If to a solution of 2.5 Gm. of Soda in 10 Cc. of water, strongly supersaturated with hydrochloric acid, 0.1 Cc. of barium chloride T.S. be added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of barium chloride T.S. (limit of *sulphate*).

If 0.7 Gm. of Soda be dissolved in 1.5 Cc. of water, and the solution added to 10 Cc. of alcohol, not more than a slight, white precipitate should occur within 10 minutes (limit of *silicate, etc.*).

After boiling this alcoholic solution with 5 Cc. of calcium hydrate T.S. and filtering, not the slightest effervescence should take place on adding the filtrate to an excess of diluted hydrochloric acid (limit of *carbonate*).

If 0.2 Gm. of Soda be dissolved in 2 Cc. of water and carefully mixed with 5 Cc. of pure sulphuric acid and 3 drops of indigo T.S., the blue color should not be entirely discharged (limit of *nitrate*).

To neutralize 0.4 Gm. of Soda should require not less than 9 Cc. of normal sulphuric acid (each Cc. corresponding to 10 per cent. of pure sodium hydrate), phenolphthalein being used as indicator.

Preparation: Liquor Sodæ.

SODII ACETAS.

SODIUM ACETATE.



Sodium Acetate should be kept in well-stoppered bottles.

Colorless, transparent, monoclinic prisms, or a granular, crystalline powder, odorless, and having a cooling, saline taste. Efflorescent in warm, dry air.

Soluble, at 15° C. (59° F.), in 1.4 parts of water, and in 30 parts of alcohol; in 0.5 part of boiling water, and in 2 parts of boiling alcohol.

When heated to 60° C. (140° F.), the salt begins to liquefy. At 123° C. (253.4° F.), it becomes dry and anhydrous; at 315° C. (599° F.), it is decomposed, with evolution of inflammable, empyreumatic vapors, leaving a black residue of sodium carbonate and carbon, which imparts to a non-luminous

flame an intense, yellow color, gives an alkaline reaction with litmus paper, and effervesces with acids.

The aqueous solution (1 in 20) of the salt colors litmus paper or T.S. blue, but does not redden phenolphthalein T.S. unless carbonate be present.

If 5 Cc. of the aqueous solution be heated with 1 Cc. of sulphuric acid and 0.5 Cc. of alcohol, acetic ether will be formed, recognizable by its odor.

On the addition of a few drops of ferric chloride T.S., the solution assumes a deep red color, and, when boiled, yields a brown precipitate.

If a non-luminous flame be colored by the introduction of the salt, and viewed through a blue glass, the yellow color should entirely disappear, no red color taking its place (absence of *potassium*).

If to 5 Cc. of the aqueous solution (1 in 20), slightly acidulated with acetic acid, an equal volume of hydrogen sulphide T.S. be added, no color or turbidity should appear, either at once (absence of *arsenic, lead, zinc, etc.*), or after adding ammonia water in slight excess (absence of *iron, etc.*).

The aqueous solution, acidulated with acetic acid, should not be rendered turbid by ammonium oxalate T.S. (absence of *calcium*).

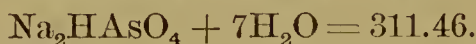
If a solution of 1 Gm. of the salt in 50 Cc. of water be slightly acidulated with nitric acid, then 0.5 Cc. of decinormal silver nitrate V.S. added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of silver nitrate V.S. (limit of *chloride*).

If to a solution of 2 Gm. of the salt in 10 Cc. of water, acidulated with hydrochloric acid, 0.1 Cc. of barium chloride T.S. be added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of barium chloride T.S. (limit of *sulphate*).

If 1.36 Gm. of Sodium Acetate be completely decomposed at a red heat, and the residue dissolved in water, it should require, for complete neutralization, 10 Cc. of normal sulphuric acid (corresponding to 100 per cent. of the pure salt), methyl-orange being used as indicator.

SODII ARSENAS.

SODIUM ARSENATE.



[SODII ARSENIAS, PHARM. 1880.]

Sodium Arsenate should be kept in well-stoppered bottles.

Colorless, transparent, monoclinic prisms, odorless, and having a mild, alkaline taste (the salt is very poisonous). Efflorescent in dry air, and somewhat deliquescent in moist air.

Soluble in 4 parts of water at 15° C. (59° F.), and very soluble in boiling water; very sparingly soluble in cold, but soluble in 60 parts of boiling alcohol.

When gently heated, the salt loses 5 molecules of water (28.8 per cent.), and is converted into a white powder. At 148° C. (298.4° F.) the rest of the water of crystallization is lost, the salt fuses, and at a red heat is converted into pyroarsenate. It imparts an intense, yellow color to a non-luminous flame.

The aqueous solution (1 in 20) of the salt yields a white precipitate with barium chloride T.S., or with calcium chloride T.S., and a dark red precipitate with silver nitrate T.S., all of which precipitates are soluble in nitric acid.

If 0.5 Cc. of the aqueous solution (1 in 20) be mixed with 2 Cc. of hydrochloric acid, and a drop of this mixture be placed upon a bright piece of copper-foil, upon applying a gentle heat, a dark steel-gray film will be deposited from the drop upon the copper.

If to 2 Cc. of the aqueous solution (1 in 20) 5 Cc. of decinormal silver nitrate V.S. be added, and the precipitate redissolved by excess of ammonia water,

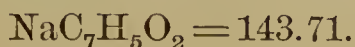
no black precipitate of reduced silver should appear on boiling (absence of *arsenite*).

If to 5 Cc. of the aqueous solution 1 Cc. of ammonium sulphide T.S. be added, no turbidity or coloration should appear (absence of *lead*, *copper*, *iron*, etc.).

Preparation: Liquor Sodii Arsenatis.

SODII BENZOAS.

SODIUM BENZOATE.



Sodium Benzoate should be kept in well-stoppered bottles.

A white, amorphous powder, odorless, or having a faint odor of benzoin, and a sweetish, astringent taste. Permanent in the air.

Soluble, at 15° C. (59° F.), in 1.8 parts of water, and in 45 parts of alcohol; in 1.3 parts of boiling water, and in 20 parts of boiling alcohol.

When heated, the salt melts, emits vapors having the odor of benzoic acid, then chars, and finally leaves a residue of sodium carbonate and carbon. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution is neutral to litmus paper.

If a few drops of ferric chloride T.S. be added to an aqueous solution of the salt, a flesh-colored precipitate will be deposited.

If 5 Cc. of diluted nitric acid be added to a solution of 1 Gm. of the salt in 10 Cc. of water, a white precipitate of benzoic acid will be produced, which, after being thoroughly washed, should conform to the tests of purity given under *Acidum Benzoicum*.

The filtrate from the precipitated benzoic acid should not be rendered turbid by silver nitrate T.S. (absence of *chloride*), nor by barium chloride T.S. (absence of *sulphate*).

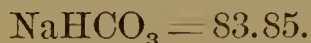
Five Cc. of the aqueous solution (1 in 20) should not give a precipitate with 0.5 Cc. of sodium cobaltic nitrite T.S. (limit of *potassium*).

If to 5 Cc. of the aqueous solution (1 in 20) an equal volume of hydrogen sulphide T.S. be added, no coloration or turbidity should be perceptible either before or after the addition of 1 Cc. of ammonia water (absence of *lead*, *iron*, etc.).

If 2 Gm. of Sodium Benzoate be ignited in a porcelain capsule until most of the carbonaceous matter is destroyed, and the residue be then dissolved in 20 Cc. of water, it should require for complete neutralization not less than 13.9 Cc. of normal sulphuric acid (corresponding to at least 99.8 per cent. of the pure salt), methyl-orange being used as indicator.

SODII BICARBONAS.

SODIUM BICARBONATE.



Sodium Bicarbonate should be kept in well-closed vessels, in a cool place.

A white, opaque powder, odorless, and having a cooling, mildly alkaline taste. Permanent in dry, but slowly decomposed in moist air.

Soluble in 11.3 parts of water at 15° C. (59° F.); above that temperature the solution loses carbon dioxide, and at a boiling heat the salt is entirely converted into normal carbonate. Insoluble in alcohol and in ether.

When heated, the salt is decomposed into normal carbonate, water, and carbon dioxide, and finally, at 100° C. (212° F.), loses about 36.3 per cent. of its weight. At a bright red heat it melts. To a non-luminous flame it imparts an intense, yellow color.

The solution, when freshly prepared with cold, distilled water, without shaking, gives a very faint alkaline reaction with litmus paper. The alkalinity increases by standing, agitation, or increase of temperature.

With acids the solution effervesces strongly.

If 1 Gm. of the salt be dissolved in 19 Cc. of water, it should yield a perfectly clear and colorless solution, leaving no residue.

If 5 Cc. of the aqueous solution (1 in 20) be slightly supersaturated with hydrochloric acid, the liquid should not be colored red by a drop of ferric chloride T.S. (absence of *sulphocyanate*).

If 1 Gm. of the salt be dissolved in 3 Cc. of acetic acid, it should yield no precipitate within an hour after being mixed with 0.5 Cc. of sodium cobaltic nitrite T.S. (limit of *potassium*).

If 0.6 Gm. of the salt be dissolved, without agitation, in 10 Cc. of cold water, and 0.1 Cc. of normal sulphuric acid added, no red color should appear upon the addition of 2 drops of phenolphthalein T.S. (limit of *normal carbonate*).

If 5 Cc. of the aqueous solution (1 in 20) be slightly supersaturated with hydrochloric acid, the solution should not be rendered turbid by the addition of an equal volume of hydrogen sulphide T.S., either at once (absence of *arsenic*, etc.), or after the addition of ammonia water in slight excess (absence of *iron*, *aluminum*, etc.).

Five Cc. of the aqueous solution, acidulated with acetic acid, should not be rendered turbid by 0.5 Cc. of ammonium oxalate T.S. (absence of *calcium*).

If 1.2 Gm. of Sodium Bicarbonate be dissolved in 10 Cc. of diluted nitric acid, then 0.5 Cc. of decinormal silver nitrate V.S. added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of silver nitrate V.S. (limit of *chloride*).

If 2.5 Gm. of the salt be dissolved in 11 Cc. of diluted hydrochloric acid, then 0.1 Cc. of nitric acid and 0.1 Cc. of barium chloride T.S. added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of barium chloride T.S. (limit of *sulphate*, *sulphite*, and *hyposulphite*).

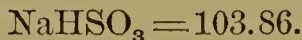
If Sodium Bicarbonate be heated in a test-tube, no *ammoniacal* vapor should be emitted.

To neutralize 0.85 Gm. of Sodium Bicarbonate should require not less than 10 Cc. of normal sulphuric acid (corresponding to at least 98.6 per cent. of the pure salt), methyl-orange being used as indicator.

Preparations : Mistura Rhei et Sodæ. Trochisci Sodii Bicarbonatis.

SODII BISULPHIS.

SODIUM BISULPHITE.



Sodium Bisulphite should be kept in a cool place, in small, well-stoppered bottles, filled as full as possible.

Opaque, prismatic crystals, or a granular powder, exhaling an odor of sulphur dioxide, and having a disagreeable, sulphurous taste. Exposed to the air, the salt loses sulphur dioxide, and is gradually oxidized to sulphate.

Soluble, at 15° C. (59° F.), in 4 parts of water, and in 72 parts of alcohol; in about 2 parts of boiling water, and in 49 parts of boiling alcohol.

When strongly heated, the salt decrepitates, emits vapors of sulphur and of sulphur dioxide, and leaves a residue of sodium sulphate. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution gives an acid reaction with litmus paper.

On the addition of hydrochloric or sulphuric acid, the aqueous solution of the salt evolves sulphur dioxide, which is recognized by its odor, and by its blackening a strip of paper dipped into mercurous nitrate T.S. and held over the escaping gas.

If 1.2 Gm. of Sodium Bisulphite be dissolved in 10 Cc. of diluted nitric acid, and the solution heated sufficiently to expel the gases, then 0.5 Cc. of decinormal silver nitrate V.S. added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of silver nitrate V.S. (limit of *chloride*).

If 2.5 Gm. of Sodium Bisulphite be dissolved in 11 Cc. of diluted hydrochloric acid with the aid of sufficient heat to expel the sulphur dioxide, the solution should not be turbid (absence of *hyposulphite*). After adding to it 0.15 Cc. of barium chloride T.S., and removing the precipitate, if any, by filtration, a portion of the clear filtrate should remain unaffected by the further addition of barium chloride T.S. (limit of *sulphate*).

If to 5 Cc. of the preceding filtrate an equal volume of hydrogen sulphide T.S. be added, no turbidity or coloration should occur (absence of *arsenic*, etc.).

If 0.26 Gm. of Sodium Bisulphite be dissolved in 20 Cc. of water, recently boiled to expel air, and a little starch T.S. be added, at least 45 Cc. of decinormal iodine V.S. should be required to produce a permanent blue tint after agitation (corresponding to at least 90 per cent. of pure Sodium Bisulphite).

SODII BORAS.

SODIUM BORATE.



[BORAX.]

Colorless, transparent, monoclinic prisms, or a white powder, inodorous, and having a sweetish, alkaline taste. Slightly efflorescent in warm, dry air.

Soluble in 16 parts of water at 15° C. (59° F.), and in 0.5 part of boiling water; insoluble in alcohol. At 80° C. (176° F.) it is soluble in 1 part of glycerin.

When heated, the salt at first loses part of its water, then melts, and, when further heated, swells up and forms a white, porous mass. At a red heat it loses all its water of crystallization (47.14 per cent.), and fuses to a colorless glass. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution (1 in 20) colors red litmus paper blue, and yellow turmeric paper reddish-brown. After being acidulated with hydrochloric acid, the solution colors blue litmus paper red; yellow turmeric paper remains unchanged at first, but, on drying, becomes brownish-red, and this color is temporarily changed to bluish-black by moistening with ammonia water.

If a drop of the solution of the salt in glycerin be held in the flame, a transient bright green color will appear.

If a slight excess of sulphuric acid be added to a hot, saturated, aqueous solution of the salt, shining, scaly crystals of boric acid will separate on cooling, which impart a green color to the flame of alcohol.

With 19 Cc. of water, 1 Gm. of the salt should yield a perfectly clear and colorless solution, leaving no residue.

The aqueous solution (1 in 20) should not effervesce with acids (absence of *carbonate*).

It should not be rendered turbid by ammonium sulphide T.S. (absence of *iron*, *aluminum*, etc.); nor, after being acidulated with hydrochloric acid, by an equal volume of hydrogen sulphide T.S. (absence of *arsenic*, *lead*, etc.).

When acidulated with acetic acid, the solution should not be rendered turbid by ammonium oxalate T.S. (absence of *calcium*).

The aqueous solution (1 in 20) should not be rendered turbid by magnesia mixture (absence of *phosphate*).

If 0.48 Gm. of the salt be dissolved in 15 Cc. of water, then 1 Cc. of diluted nitric acid and 0.2 Cc. of decinormal silver nitrate V.S. added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of silver nitrate V.S. (limit of *chloride*).

If 2.5 Gm. of the salt be dissolved in 50 Cc. of water, then 10 Cc. of diluted hydrochloric acid and 0.1 Cc. of barium chloride T.S. added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of barium chloride T.S. (limit of *sulphate*).

If 1 Gm. of the salt be dissolved in 20 Cc. of diluted sulphuric acid by the aid of heat, and 3 drops of indigo T.S. be added, the blue color should not be discharged (absence of *nitrate*).

SODII BROMIDUM.

SODIUM BROMIDE.

$\text{NaBr} = 102.76.$

Sodium Bromide should be kept in well-stoppered bottles.

Colorless or white, cubical crystals, or a white, granular powder, odorless, and having a saline, slightly bitter taste. From air the salt attracts moisture without deliquescing.

Soluble, at 15° C. (59° F.), in 1.2 parts of water, and in 13 parts of alcohol; in 0.5 part of boiling water, and in 11 parts of boiling alcohol.

When heated to a bright red heat, the salt melts, and, at a somewhat higher temperature, slowly volatilizes without decomposition. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution is neutral, or at most very feebly alkaline, to litmus paper.

If a few drops of chloroform be poured into 10 Cc. of the aqueous solution (1 in 20), then 1 Cc. of chlorine water added, and the mixture agitated, the liberated bromine will dissolve in the chloroform, imparting to it a yellow or brownish-yellow color, without a violet tint.

The aqueous solution (1 in 20) should be clear and colorless, and should not be rendered turbid by sodium bitartrate T.S., nor by sodium cobaltic nitrite T.S. (limit of *potassium*); nor by ammonium oxalate T.S. (absence of *calcium*); nor by barium chloride T.S. (absence of *sulphate*).

If the aqueous solution be slightly acidulated with hydrochloric acid, it should not be rendered turbid by the addition of an equal volume of hydrogen sulphide T.S., either at once (absence of *arsenic*, *lead*, etc.), or after adding ammonia water in slight excess (absence of *iron*, *aluminum*, etc.).

If diluted sulphuric acid be dropped upon some of the powdered salt, no yellow color should appear at once (absence of *bromate*).

If 5 Cc. of the aqueous solution (1 in 20) be mixed with a few drops of starch T.S., and then 0.5 Cc. of chlorine water added, no blue color should appear (absence of *iodine*).

If 1 Gm. of the powdered salt be kept for twenty minutes at the temperature of 100° C. (212° F.), or slightly above it, it should not lose more than 0.03 Gm. in weight (limit of *moisture*).

If 0.3 Gm. of the well-dried salt be dissolved in 10 Cc. of water, and 2 drops of potassium chromate T.S. be added, it should not require more than 29.8 Cc. of decinormal silver nitrate V.S. to produce a permanent red color (corresponding to at least 97.29 per cent. of the pure salt).

SODII CARBONAS.**SODIUM CARBONATE.**

Sodium Carbonate should be kept in well-closed vessels.

Colorless, monoclinic crystals, odorless, and having a strongly alkaline taste. In dry air the salt effloresces, and, if left exposed, soon loses about half of its water of crystallization (31.46 per cent. of its weight), and becomes a white powder.

Soluble in 1.6 parts of water at 15° C. (59° F.), in 0.09 part at 38° C. (100.4° F.), and in 0.2 part of boiling water; insoluble in alcohol and in ether; soluble in 1.02 parts of glycerin.

When heated to 32.5° C. (90.5° F.), the crystals fuse in their water of crystallization, and lose some water. At a higher temperature, the salt continues to lose water, until, at last, an anhydrous residue is left, corresponding to 37 per cent. of the weight of the crystals. At a bright red heat the anhydrous salt fuses. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution gives an alkaline reaction with litmus paper, and effervesces strongly with acids.

On treating the salt with 20 parts of water, a clear and colorless solution should be formed, and no insoluble residue should be left.

If 5 Cc. of the aqueous solution (1 in 20) be slightly supersaturated with hydrochloric acid, the liquid should not be colored red by a drop of ferric chloride T.S. (absence of *sulphocyanate*).

If to 5 Cc. of the aqueous solution, slightly supersaturated with hydrochloric acid, an equal volume of hydrogen sulphide T.S. be added, no turbidity should be produced, either before or after the addition of ammonia water in slight excess (absence of *arsenic, lead, iron, aluminum, etc.*).

If 5 Cc. of the aqueous solution be slightly supersaturated with acetic acid, the addition of 0.5 Cc. of ammonium oxalate T.S. should produce no turbidity (absence of *calcium*).

If 5 Cc. of the aqueous solution be slightly supersaturated with acetic acid, the addition of 0.5 Cc. of sodium cobaltic nitrite T.S. should not render it turbid within one hour (limit of *potassium*).

If 1.2 Gm. of the salt be dissolved in 10 Cc. of diluted nitric acid, then 0.5 Cc. of decinormal silver nitrate V.S. added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of silver nitrate V.S. (limit of *chloride*).

If 2.5 Gm. of the salt be dissolved in 10 Cc. of diluted hydrochloric acid, then 0.1 Cc. of nitric acid and 0.1 Cc. of barium chloride T.S. added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of barium chloride T.S. (limit of *sulphate, sulphite, and hyposulphite*).

If the crystallized salt be heated in a test-tube, the vapor of *ammonia* should not be evolved.

To neutralize 1 Gm. of anhydrous Sodium Carbonate (deprived of its water of crystallization by heat immediately before being weighed) should require not less than 18.7 Cc. of normal sulphuric acid (corresponding to not less than 98.9 per cent. of the pure salt), methyl-orange being used as indicator.

Preparation: Sodii Carbonas Exsiccatus.

SODII CARBONAS EXSICCATUS.**DRIED SODIUM CARBONATE.**

Sodium Carbonate, two hundred grammes 200 Gm.

To make one hundred grammes 100 Gm.

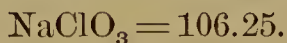
Break the crystals into small fragments, and allow them to effloresce for several days in warm air, at a temperature not exceeding 25° C. (77° F.), until they are completely disintegrated; then dry the white powder at a temperature of about 45° C. (113° F.), until its weight is reduced to *one hundred* (100) grammes. Pass the powder through a sieve, and preserve it in well-stoppered bottles.

A loose, white powder, conforming to the reactions and tests given under *Sodii Carbonas*.

To neutralize 1 Gm. of the salt should require not less than 13.8 Cc. of normal sulphuric acid (corresponding to about 73 per cent. of anhydrous Sodium Carbonate), methyl-orange being used as indicator.

SODII CHLORAS.

SODIUM CHLORATE.



Sodium Chlorate should be kept in glass-stoppered bottles, and *great caution* should be observed in handling the salt, as dangerous explosions are liable to occur when it is mixed with organic matters (cork, tannic acid, sugar, etc.), or with sulphur, antimony sulphide, phosphorus, or other easily oxidizable substances, and either heated directly, or subjected to trituration or concussion.

Colorless, transparent crystals (principally regular cubes with tetrahedral facets), or a crystalline powder, odorless, and having a cooling, saline taste. Permanent in dry air.

Soluble, at 15° C. (59° F.), in 1.1 parts of water, and in about 100 parts of alcohol; in 0.5 part of boiling water, and in about 40 parts of boiling alcohol; also soluble in 5 parts of glycerin.

When heated, the salt melts, then gives off oxygen (about 45 per cent. of its weight), and finally leaves a residue of sodium chloride, readily soluble in water, and yielding, with silver nitrate T.S., a white, curdy precipitate insoluble in nitric acid. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution is neutral to litmus paper.

When a crystal of the salt is dropped into hydrochloric acid, the liquid assumes a deep greenish-yellow color, and emits the odor of chlorine.

A saturated, aqueous solution should not be rendered turbid by sodium bitartrate T.S. (limit of *potassium*).

An aqueous solution of the residue left after igniting a portion of the salt should not give an alkaline reaction with litmus paper (absence of *tartrate*).

The aqueous solution (1 in 20), slightly acidulated with acetic acid, should not be rendered turbid by the addition of an equal volume of hydrogen sulphide T.S., either at once (absence of *arsenic*, *lead*, etc.), or after the addition of ammonia water in slight excess (absence of *iron*, *aluminum*, etc.).

The aqueous solution (1 in 20) should not be rendered turbid by adding to it a few drops of ammonia water and then sodium phosphate T.S. (absence of *magnesium*, etc.).

The solution (1 in 20), slightly acidulated with acetic acid, should not be rendered turbid by ammonium oxalate T.S. (absence of *calcium*); nor by barium chloride T.S. (absence of *sulphate*); nor should silver nitrate T.S. produce in it more than a slight opalescence (limit of *chloride*).

SODII CHLORIDUM.**SODIUM CHLORIDE.**

Colorless, transparent, cubical crystals, or a white, crystalline powder, odorless, and having a purely saline taste. Permanent in dry air.

Soluble in 2.8 parts of water at 15° C. (59° F.), and in 2.5 parts of boiling water; almost insoluble in alcohol; insoluble in ether or chloroform.

When heated, the salt decrepitates. At a red heat it fuses, and at a white heat it is slowly volatilized and partly decomposed. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution of the salt is neutral to litmus paper.

With silver nitrate T.S. the solution yields a white, curdy precipitate insoluble in nitric acid.

No turbidity should be produced in 5 Cc. of the aqueous solution (1 in 20) by the addition of 0.5 Cc. of sodium cobaltic nitrite T.S. (limit of *potassium*).

The aqueous solution, slightly acidulated with acetic acid, should not be rendered turbid by ammonium oxalate T.S. (absence of *calcium*); nor by barium chloride T.S. (absence of *sulphate*); nor by an equal volume of hydrogen sulphide T.S., either before or after addition of ammonia water in slight excess (absence of *arsenic, lead, zinc, iron, aluminum*, etc.).

No turbidity should be produced in the aqueous solution by the addition of sodium phosphate T.S. and a few drops of ammonia water (absence of *magnesium*, etc.).

If 2 Gm. of the finely powdered salt be digested for some hours with 25 Cc. of warm alcohol, and, after cooling, the undissolved salt be removed by filtration, then the filtrate evaporated to dryness and the residue dissolved in 1 Cc. of water and mixed with a few drops of starch T.S., the addition of chlorine water, drop by drop, should produce neither a blue nor a yellow tint (absence of *iodide or bromide*).

If 0.195 Gm. of well-dried Sodium Chloride be dissolved in 10 Cc. of water, and the solution mixed with a few drops of potassium chromate T.S., it should require not less than 33.4 Cc. of decinormal silver nitrate V.S. to produce a permanent red color (corresponding to at least 99.9 per cent. of the pure salt).

SODII HYPOPHOSPHIS.**SODIUM HYPOPHOSPHITE.**

Sodium Hypophosphite should be kept in well-stoppered bottles.

Small, colorless, transparent, rectangular plates of a pearly lustre, or a white granular powder, odorless, and having a bitterish-sweet, saline taste. Very deliquescent on exposure to moist air.

Soluble, at 15° C. (59° F.), in 1 part of water, and in 30 parts of alcohol; in 0.12 part of boiling water, and in 1 part of boiling alcohol; slightly soluble in absolute alcohol; insoluble in ether.

When heated in a test-tube, the salt at first loses its water of crystallization, and at about 200° C. (392° F.) it is decomposed, evolving hydrogen and hydrogen phosphide, which burn with a bright yellow flame. Finally there is left a residue of sodium pyrophosphate and metaphosphate, sometimes mingled with a little red phosphorus. To a non-luminous flame the salt communicates an intense, yellow color.

On triturating or heating Sodium Hypophosphite with nitrates, chlorates, or other oxidizing agents, it detonates violently.

The aqueous solution is neutral to litmus paper.

A 5-per-cent. aqueous solution of the salt yields, with silver nitrate T.S., a white precipitate, which rapidly turns brown or black, owing to the separation of metallic silver.

When an aqueous solution of the salt (1 in 20), acidulated with hydrochloric acid, is added in small quantity to an excess of mercuric chloride T.S., a white precipitate of mercurous chloride is formed. On further addition of the solution, the precipitate is reduced to metallic mercury.

A solution of 0.5 Gm. of the salt in 1 Cc. of water should yield no precipitate upon the addition of 1 Cc. of sodium bitartrate T.S. (limit of *potassium*).

The aqueous solution (1 in 20) should not be colored red by the addition of a drop of phenolphthalein T.S., nor effervesce on the addition of an acid (absence of *caustic alkali* or *carbonate*); nor should it be rendered turbid by ammonium oxalate T.S. (absence of *calcium*).

In the aqueous solution (1 in 20), acidulated with hydrochloric acid, an equal volume of hydrogen sulphide T.S. should not produce any turbidity (absence of *arsenic*, *lead*, etc.).

After heating 10 Cc. of the aqueous solution (1 in 20) with 1 Cc. of nitric acid, separate portions of the solution should remain clear upon the addition of silver nitrate T.S. (absence of *chloride*), and of barium chloride T.S. (absence of *sulphate*).

Not more than a slight cloudiness should be produced in the aqueous solution of the salt by magnesia mixture (limit of *phosphate*).

Potassium ferrocyanide T.S. should not produce in the acidulated solution any blue color (absence of *iron*).

If 0.1 Gm. of dry Sodium Hypophosphite be dissolved in 10 Cc. of water, mixed with 7.5 Cc. of sulphuric acid and 40 Cc. of decinormal potassium permanganate V.S., and the mixture boiled for fifteen minutes, it should require not more than 3 Cc. of decinormal oxalic acid V.S. to discharge the red color (corresponding to at least 97.96 per cent. of the pure salt).

Preparation : Syrupus Hypophosphitum.

SODII HYPOSULPHIS.

SODIUM HYPOSULPHITE.



[SODIUM THIOSULPHATE.]

Sodium Hyposulphite should be kept in well-stoppered bottles.

Colorless, transparent, monoclinic prisms, odorless, and having a cooling, afterwards bitter taste. Permanent in the air below 33° C. (91.4° F.), but efflorescent in dry air above that temperature.

Soluble in 0.65 part of water at 15° C. (59° F.), and in about 0.5 part at 20° C. (68° F.); at a boiling heat the solution is rapidly decomposed. Insoluble in alcohol; slightly soluble in oil of turpentine.

When rapidly heated to about 50° C. (122° F.), the salt melts. When slowly heated until it is effloresced, and afterwards to 100° C. (212° F.), it loses all its water of crystallization (36.3 per cent.), and at a red heat is decomposed, sulphur being evolved, while a residue of sodium sulphide and sulphate remains. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution is neutral to litmus paper.

An aqueous solution of the salt readily dissolves many salts of silver (chloride, bromide, iodide, oxide, etc.), and discharges the color of a solution of iodine or of starch iodide.

If ferric chloride T.S. be dropped into the aqueous solution (1 in 20), a dark violet color will be produced, which disappears rapidly on agitation.

Addition of sulphuric or hydrochloric acid to the aqueous solution liberates from it sulphur dioxide (known by its odor, and by its blackening a strip of

paper moistened with mercurous nitrate T.S. and held in the escaping gas), and causes a white precipitate of sulphur (distinction from *sulphite* or *bisulphite*).

If to 5 Cc. of the aqueous solution (1 in 20) an equal volume of hydrogen sulphide T.S. be added, no coloration or turbidity should be perceptible either before or after the addition of 1 Cc. of ammonia water (absence of *lead*, *iron*, etc.).

The aqueous solution should not be rendered turbid by the addition of ammonium oxalate T.S. (absence of *calcium*).

The aqueous solution of the salt (1 in 20) should not be colored red by a drop of phenolphthalein T.S. (absence of *caustic alkali* or *carbonate*); nor should a drop of silver nitrate T.S. produce a brown or a black precipitate in 5 Cc. of this solution (absence of *sulphide*).

In a dilute aqueous solution (1 in 80), barium chloride T.S. should produce no turbidity (absence of *sulphate*).

If 0.25 Gm. of Sodium Hyposulphite be dissolved in 10 Cc. of water and a few drops of starch T.S. added, it should require at least 9.9 Cc. of decinormal iodine V.S. to produce a permanent blue color (corresponding to at least 98.1 per cent. of the pure salt).

SODII IODIDUM.

SODIUM IODIDE.

$$\text{NaI} = 149.53.$$

Sodium Iodide should be kept in well-stoppered bottles.

Colorless, cubical crystals, or a white, crystalline powder, odorless, and having a saline and slightly bitter taste. In moist air it deliquesces and becomes partially decomposed into sodium carbonate and free iodine, assuming, thereby, a reddish color.

Soluble, at 15° C. (59° F.); in 0.6 part of water, and in about 3 parts of alcohol; in 0.33 part of boiling water, and in 1.4 parts of boiling alcohol.

When heated, the salt melts, and at a bright red heat it is slowly volatilized and partly decomposed. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution is neutral or but feebly alkaline to litmus paper.

If to 5 Cc. of the aqueous solution (1 in 20) 1 Cc. of chlorine water be added, iodine will be liberated and impart to the solution a yellow color. On agitating this mixture with a few drops of chloroform, the latter will acquire a violet color.

If the salt be in distinct crystals, only few monoclinic prisms (containing 2 molecules of water) should be found among the regular cubes of the anhydrous salt. On drying 1 Gm. of the salt at 100° C. (212° F.), it should not lose more than 0.05 Gm. in weight (absence of more than 5 per cent. of *water*).

A solution of 1 Gm. of the salt in 1 Cc. of water should yield no precipitate with 1 Cc. of sodium bitartrate T.S. (limit of *potassium*).

The aqueous solution (1 in 20), slightly acidulated with acetic acid, should remain clear after the addition of ammonium oxalate T.S. (absence of *calcium*), or of an equal volume of hydrogen sulphide T.S. (absence of *arsenic*, etc.).

The addition of ammonium sulphide T.S. should not produce either a coloration or a turbidity in the aqueous solution (absence of *zinc*, *iron*, *aluminum*, etc.).

If 1 Gm. of the salt be dissolved in water, and 0.05 Cc. (1 drop) of decinormal oxalic acid V.S. added, no red color should be produced by the addition of a drop of phenolphthalein T.S. (limit of *alkali*).

The aqueous solution, slightly acidulated with hydrochloric acid, should not be colored blue upon the addition of potassium ferrocyanide T.S. (absence of *iron*).

If 0.5 Gm. of the salt be dissolved in 10 Cc. of freshly boiled distilled water, and the solution mixed with a few drops of starch T.S., no blue color should

appear either at once (absence of *free iodine*), or after the addition of a drop of diluted hydrochloric acid (absence of *iodate*).

If 5 Cc. of the aqueous solution (1 in 20) be acidulated with hydrochloric acid, and 0.5 Cc. of barium chloride T.S. added, no immediate turbidity should appear (limit of *sulphate*).

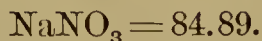
If 5 Cc. of the aqueous solution be gently heated with 1 drop of ferrous sulphate T.S. and 0.5 Cc. of potassium hydrate T.S., no blue color should appear after acidulating the mixture with hydrochloric acid (absence of *cyanide*).

If 1 Gm. of the salt be mixed with 0.5 Gm. of iron filings and 0.5 Gm. of powdered zinc, and heated in a test-tube with 5 Cc. of sodium hydrate T.S., no ammoniacal vapors should be evolved (absence of *nitrate* or *nitrite*).

If 0.5 Gm. of the well-dried salt be dissolved in 10 Cc. of water, and 2 drops of potassium chromate T.S. added, it should not require more than 34.5 Cc. nor less than 33.4 Cc. of decinormal silver nitrate V.S. to produce a permanent red color (corresponding to at least 98 per cent. of the pure salt).

SODII NITRAS.

SODIUM NITRATE.



Sodium Nitrate should be kept in well-stoppered bottles.

Colorless, transparent, rhombohedral crystals, odorless, and having a cooling, saline, and slightly bitter taste. Deliquescent in moist air.

Soluble, at 15° C. (59° F.), in 1.3 parts of water, and in about 100 parts of alcohol; in 0.6 part of boiling water, and in 40 parts of boiling alcohol.

When heated at 312° C. (593.6° F.), the salt melts without decomposition. At a higher temperature it evolves oxygen, and is reduced to nitrite. On red-hot charecoal it deflagrates. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution is neutral to litmus paper.

If the aqueous solution be mixed in a test-tube with a drop of diphenylamine T.S., and sulphuric acid be carefully poured in, so as to form a separate layer, a deep blue color will appear at the line of contact.

A solution of 0.5 Gm. of the salt in 1 Cc. of water should not be precipitated or rendered turbid by 1 Cc. of sodium bitartrate T.S. (limit of *potassium*).

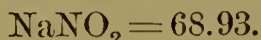
The aqueous solution (1 in 20) should not be colored or rendered turbid by the addition of hydrogen sulphide T.S. or ammonium sulphide T.S. (absence of *arsenic* and *metallic impurities*); nor by the addition of equal parts of ammonia water and sodium phosphate T.S. (absence of *calcium*, *magnesium*, etc.).

If the aqueous solution be mixed with a few drops, each, of hydrogen sulphide T.S. and starch T.S., and then some chlorine water poured carefully upon the mixture, no blue color should appear at the line of contact (absence of *iodate* and *iodide*).

No turbidity should be produced within five minutes in the aqueous solution, acidulated with nitric acid, on the addition of either barium chloride T.S. (limit of *sulphate*), or silver nitrate T.S. (limit of *chloride*).

SODII NITRIS.

SODIUM NITRITE.



Sodium Nitrite should be kept in well-stoppered bottles.

White, opaque, fused masses, usually in the form of pencils, or colorless, transparent, hexagonal crystals; odorless, and having a mild, saline taste.

When exposed to the air, the salt deliquesces and is gradually oxidized to sodium nitrate.

Soluble in about 1.5 parts of water at 15° C. (59° F.), and very soluble in boiling water; slightly soluble in alcohol.

When heated, the salt melts, and at a red heat it is decomposed, yielding oxygen, nitrogen, nitrogen dioxide, and sodium oxide. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution gives an alkaline reaction with litmus paper.

If the aqueous solution of the salt be mixed with some potassium iodide T.S., and a few drops of an acid added, iodine will be liberated, and nitrogen dioxide gas will escape with effervescence.

The salt should readily dissolve in 20 parts of water, forming a colorless solution, and leaving no insoluble residue (absence of *insoluble impurities*).

If 1 drop of hydrochloric acid and a few drops of starch T.S. be added to 5 Cc. of the aqueous solution, no blue coloration should appear (absence of *iodide*).

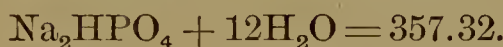
If 5 Cc. of the aqueous solution be mixed with an equal volume of hydrogen sulphide T.S., no coloration or precipitate should be produced (absence of *lead, arsenic, copper, etc.*).

If 0.15 Gm. of Sodium Nitrite be dissolved in 5 Cc. of water, and introduced into a nitrometer, then followed by a solution of 1 Gm. of potassium iodide in 6 Cc. of water and 15 Cc. of normal sulphuric acid, the liberated nitrogen dioxide gas should measure not less than 50 Cc. at 15° C. (59° F.), or 51.7 Cc. at 25° C. (77° F.), corresponding to not less than 97.6 per cent. of the pure salt.

Preparation: Spiritus Ætheris Nitrosi.

SODII PHOSPHAS.

SODIUM PHOSPHATE.



[SODIUM ORTHOPHOSPHATE.]

Sodium Phosphate should be kept in well-stoppered bottles, in a cool place.

Large, colorless, monoclinic prisms, odorless, and having a cooling, saline taste. The crystals effloresce in the air, and gradually lose 5 molecules of their water of crystallization (25.1 per cent.).

Soluble in 5.8 parts of water at 15° C. (59° F.), and in somewhat less than 1.5 parts of boiling water; insoluble in alcohol.

When heated to about 40° C. (104° F.), the salt fuses, yielding a colorless liquid. At 100° C. (212° F.) it loses all its water of crystallization (60.3 per cent.), and at a red heat it is converted into sodium pyrophosphate. It imparts to a non-luminous flame an intense, yellow color.

The aqueous solution is slightly alkaline to litmus paper, but not to phenolphthalein paper.

A 5-per-cent. aqueous solution of the salt yields a white precipitate with magnesia mixture.

With silver nitrate T.S. it yields a yellow precipitate, soluble in ammonia water and in nitric acid.

If 0.5 Cc. of the aqueous solution (1 in 20) be mixed with 1 Cc. of ammonium molybdate T.S., the mixture will at once assume a yellow color, and, after a few minutes, yield a yellow precipitate, the appearance of which is hastened by a gentle heat.

No residue should be left on dissolving the salt in water (absence of *calcium, etc.*).

No turbidity or coloration should be produced in the aqueous solution by the addition of a small quantity of ammonium sulphide T.S.; or of an equal

volume of hydrogen sulphide T.S. after the addition of a few drops of hydrochloric acid (absence of *metallic impurities*).

If 1 Gm. of the powdered salt be shaken with 3 Cc. of stannous chloride T.S. (see List of Reagents, Bettendorff's Test for Arsenic), then a small piece of pure tin-foil added, and a gentle heat applied, no brown coloration should appear within fifteen minutes (limit of *arsenic*).

If 0.5 Gm. of the salt be dissolved in 4 Cc. of water, and 1 Cc. of sodium bitartrate T.S. then added, the solution should remain perfectly clear (limit of *potassium*).

No effervescence should occur on the addition of hydrochloric or nitric acid to a solution of the salt (absence of *carbonate*).

On adding to 5 Cc. of the aqueous solution (1 in 20) 0.5 Cc. of silver nitrate T.S., a pure yellow precipitate will be formed, which should not become dark-colored by heating (absence of *hypophosphite*, etc.), and which, upon the addition of nitric acid, should yield a perfectly clear, or, at most, only a very slightly opalescent, liquid (limit of *chloride*).

If to 5 Cc. of the aqueous solution, acidulated with hydrochloric acid, 0.5 Cc. of barium chloride T.S. be added, the solution should not be rendered more than very slightly opalescent (limit of *sulphate*).

SODII PYROPHOSPHAS.

SODIUM PYROPHOSPHATE.



Colorless, transparent, monoclinic prisms, or a crystalline powder, odorless, and having a cooling, saline, and feebly alkaline taste. Permanent in cool air, slightly efflorescent in warm air.

Soluble in 12 parts of water at 15° C. (59° F.), and in 1.1 parts of boiling water; insoluble in alcohol.

When heated to 100° C. (212° F.), the salt loses its water of crystallization (40.34 per cent.) without previous fusion. At a higher temperature it fuses, forming a transparent liquid, which, on cooling, solidifies to a crystalline mass. To a non-luminous flame it imparts an intense, yellow color.

Its aqueous solution is feebly alkaline to litmus and to phenolphthalein paper.

A 5-per-cent. aqueous solution of the salt yields with magnesia mixture a white precipitate; with silver nitrate T.S. it yields a precipitate of a pure white color (distinction from *orthophosphate*), soluble in ammonia water and in nitric acid.

With ammonium molybdate T.S. no precipitate is formed within 15 or 20 minutes, even when a gentle heat is applied (distinction from *orthophosphate*).

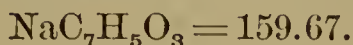
No turbidity or coloration should be produced in the aqueous solution (1 in 20) by the addition of a small quantity of ammonium sulphide T.S.; or of an equal volume of hydrogen sulphide T.S. after the addition of a few drops of hydrochloric acid (absence of *metallic impurities*).

If 1 Gm. of the powdered salt be shaken with 3 Cc. of stannous chloride T.S. (see List of Reagents, Bettendorff's Test for Arsenic), then a small piece of pure tin-foil added, and a gentle heat applied, no brown coloration should appear within fifteen minutes (limit of *arsenic*).

If 0.5 Gm. of the salt be dissolved in 6 Cc. of water, and 1 Cc. of sodium bitartrate T.S. then added, the solution should remain perfectly clear (limit of *potassium*).

No effervescence should occur on the addition of hydrochloric or nitric acid to a solution of the salt (absence of *carbonate*).

In the aqueous solution of the salt, rendered acid by nitric acid, not more than a very slight opalescence should be produced by silver nitrate T.S. (limit of *chloride*), or by barium chloride T.S. (limit of *sulphate*).

SODII SALICYLAS.**SODIUM SALICYLATE.**

Sodium Salicylate should be kept in well-stoppered bottles, protected from heat and light.

A white, amorphous powder, odorless, and having a sweetish, saline taste. Permanent in cool air.

Soluble in 0.9 part of water, and in 6 parts of alcohol at 15° C. (59° F.); very soluble in boiling water or alcohol; also soluble in glycerin.

When heated, the salt is decomposed, giving off inflammable vapors and an odor of phenol, and finally leaves a residue of sodium carbonate. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution slightly reddens blue litmus paper.

Ferric chloride T.S., added to an excess of a concentrated solution of the salt, produces a red precipitate; but when added to a very dilute solution (1 in 100), it produces a deep violet-blue color.

If copper sulphate T.S. be added to the aqueous solution (1 in 20), a green color will be produced.

On adding to about 0.2 Gm. of the salt, in a test-tube, about 1 Cc. of concentrated sulphuric acid, and then, cautiously, about 1 Cc. of methylic alcohol in drops, on heating the mixture to boiling, the odor of methyl salicylate will be evolved.

Hydrochloric or sulphuric acid produces in a concentrated aqueous solution of the salt a voluminous, white precipitate, which, after being separated by filtration, and washed, should conform to the reactions and tests given under *Acidum Salicylicum*.

The aqueous solution should be colorless, even when concentrated, and should not effervesce on the addition of acids (absence of *carbonate*).

When the solution (1 in 20) is mixed with a small quantity of ammonium sulphide T.S., or with an equal volume of hydrogen sulphide T.S., no coloration or turbidity should appear (absence of *metallic impurities*).

If 1 Gm. of the salt be dissolved in a mixture of 50 Cc. of alcohol and 25 Cc. of water, then acidulated with nitric acid and filtered, a portion of the filtrate should not be rendered turbid by the addition of a few drops of barium chloride T.S. (absence of *sulphate*).

Another portion of the filtrate should remain clear on the addition of a few drops of silver nitrate T.S. (absence of *chloride*).

If 1 part of the salt be agitated with 15 parts of cold, concentrated sulphuric acid, no brown color should be produced within fifteen minutes (absence of *readily carbonizable, organic impurities*).

SODII SULPHAS.**SODIUM SULPHATE.**

[GLAUBER'S SALT.]

Sodium Sulphate should be kept in well-closed vessels.

Large, colorless, transparent, monoclinic prisms, or granular crystals, odorless, and having a bitter, saline taste. The salt effloresces rapidly in the air, and finally loses all its water of crystallization.

Soluble, at 15° C. (59° F.), in 2.8 parts of water. The solubility increases up to 34° C. (93.2° F.), when its maximum is attained, 1 part of the salt then dissolving in somewhat less than 0.25 part of water; from thence it gradually decreases with rising temperature, until 1 part requires 0.47 part of boiling water for solution. Insoluble in alcohol; soluble in glycerin.

When heated to 33° C. (91.4° F.), the salt fuses, and, on being heated to 100° C. (212° F.), loses all its water (55.9 per cent.). At a red heat the anhydrous salt fuses without decomposition. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution is neutral to litmus paper.

A 5-per-cent. aqueous solution of the salt yields, with barium chloride T.S., a white precipitate insoluble in nitric acid.

If to 5 Cc. of the aqueous solution (1 in 20) 1 Cc. of sodium phosphate T.S. and 0.5 Cc. of ammonia water be added, no turbidity or precipitate should be produced, even after agitation (absence of *magnesium*, etc.).

The solution should not effervesce on the addition of an acid (absence of *carbonate*).

It should not be colored or rendered turbid by the addition of ammonium sulphide T.S.; or of an equal volume of hydrogen sulphide T.S., after being acidulated with hydrochloric acid (absence of *arsenic* and *metallic impurities*).

After acidulation with nitric acid, the aqueous solution should remain clear, or at most be rendered only very slightly opalescent, on the addition of silver nitrate T.S. (limit of *chloride*).

SODII SULPHIS.

SODIUM SULPHITE.



Sodium Sulphite should be kept in well-stoppered bottles, in a cool place.

Colorless, transparent, monoclinic prisms, odorless, and having a cooling, saline, sulphurous taste. In air the salt effloresces, and is slowly oxidized to sulphate.

Soluble in 4 parts of water at 15° C. (59° F.), and in 0.9 part of boiling water; sparingly soluble in alcohol.

When gently heated, the salt softens somewhat, but does not fuse. Above 100° C. (212° F.) the crystals lose all their water (50 per cent.), without fusing or changing their shape. At a red heat the salt fuses to a reddish-yellow mass of sodium sulphate and sodium sulphide. To a non-luminous flame the salt imparts an intense, yellow color.

The aqueous solution is neutral or feebly alkaline to litmus paper.

Upon the addition of hydrochloric acid to the salt or its solution, sulphur dioxide gas is liberated, which is recognized by its odor, and by its blackening a strip of paper moistened with mercurous nitrate T.S. and held in the escaping gas; the solution remains clear, no sulphur being separated (distinction from *hyposulphite*).

The aqueous solution (1 in 20) should not be colored or rendered turbid by the addition of an equal volume of hydrogen sulphide T.S., either before or after the addition of ammonia water in slight excess (absence of *metallic impurities*).

If a solution of 2.5 Gm. of the salt in 11 Cc. of diluted hydrochloric acid be heated sufficiently to expel the sulphur dioxide, then 0.15 Cc. of barium chloride T.S. added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unaffected by the further addition of barium chloride T.S. (limit of *sulphate*).

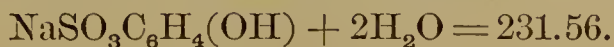
If 1.2 Gm. of Sodium Sulphite be dissolved in 10 Cc. of diluted nitric acid, the solution heated to expel the gases, then 0.4 Cc. of decinormal silver nitrate

V.S. added, and the precipitate, if any, removed by filtration, the clear filtrate should remain unchanged by the further addition of silver nitrate V.S. (limit of *chloride*).

If 0.63 Gm. of the salt be dissolved in 25 Cc. of water recently boiled to expel air, and a little starch T.S. be added, at least 48 Cc. of decinormal iodine V.S. should be required to produce a permanent blue tint (each Cc. corresponding to 2 per cent. of the pure salt).

SODII SULPHOCARBOLAS.

SODIUM SULPHOCARBOLATE.



[SODIUM PARAPHENOLSULPHONATE.]

Colorless, transparent, rhombic prisms, odorless, and having a cooling, saline, slightly bitter taste. Somewhat efflorescent in dry air.

Soluble, at 15° C. (59° F.), in 4.8 parts of water, and in 132 parts of alcohol; in 0.7 part of boiling water, and in 10 parts of boiling alcohol.

When heated a little above 100° C. (212° F.), the salt loses all its water (15.5 per cent.) and becomes white. At a higher temperature it chars, emits inflammable vapors having the odor of phenol, and finally leaves a residue of sodium sulphate amounting to 30.6 per cent. of the original weight. To a non-luminous flame it imparts an intense, yellow color.

The aqueous solution is neutral to litmus paper.

A dilute solution (1 in 100) of the salt is rendered pale violet by ferric chloride T.S., but remains clear; barium chloride T.S. leaves the solution clear, but if a portion of the salt be ignited, and the residue dissolved in water, the same reagent will produce in the solution a copious, white precipitate.

In the aqueous solution (1 in 20) neither hydrogen sulphide T.S. nor ammonium sulphide T.S. should produce any turbidity or coloration (absence of *metallic impurities*); nor should more than a faint opalescence be produced by barium chloride T.S. (limit of *sulphate*), or by silver nitrate T.S. (limit of *chloride*).

SPARTEINÆ SULPHAS.

SPARTEINE SULPHATE.



The neutral sulphate of an alkaloid obtained from *Scoparius*.

Colorless, white, prismatic crystals, or a granular powder, odorless, and having a slightly saline and somewhat bitter taste. Liable to attract moisture when exposed to damp air.

Very soluble in water and alcohol.

When heated to about 83° C. (181.4° F.), the salt begins to lose its water of crystallization, all of which escapes at 100° C. (212° F.). At about 136° C. (276.8° F.) it melts, and, upon ignition, it is consumed, leaving no residue.

The salt is neutral to litmus paper.

If 25 Cc. of ether be added to about 0.1 Gm. of Sparteine Sulphate in a test-tube, then a few drops of dilute ammonia water, so that the latter shall not be in excess, and an ethereal solution of iodine (1 in 50) be afterwards added until the liquid, when shaken, turns from an orange to a dark reddish-brown color, the bottom and sides of the test-tube will after a short time be found coated with minute, dark greenish-brown crystals, distinctly seen with a lens after the liquid has been poured out.

On shaking 0.05 Gm. of the salt, in a test-tube, with 5 Cc. of potassium or sodium hydrate T.S., the liquid will at first be turbid, and small drops of sparteine will gradually collect on the surface. If a strip of moistened red litmus paper be suspended in the mouth of the test-tube, and a gentle heat then applied, the test-paper will gradually acquire a blue color, but no ammoniacal odor should be perceptible (absence of *ammonium salts*).

SPIGELIA.

SPIGELIA.

[PINKROOT.]

The rhizome and roots of *Spigelia marilandica* Linné (nat. ord. *Loganiaceæ*).

Of horizontal growth, about 5 Cm. or more long, 2 or 3 Mm. thick, dark purplish-brown, bent, somewhat branched, on the upper side with cup-shaped scars; on the lower side with numerous, thin, brittle, lighter-colored roots, about 10 Cm. long; the rhizome internally with a whitish wood and a pith which is usually dark-colored or decayed; odor somewhat aromatic, taste sweetish, bitter and pungent.

It should not be confounded with the underground portion of *Phlox Carolina* Linné (nat. ord. *Polemoniaceæ*), the roots of which are brownish-yellow, rather coarse, straight, and contain a straw-colored wood underneath a readily removable bark.

Preparation: Extractum Spigeliæ Fluidum.

SPIRITUS ÆTHERIS.

SPIRIT OF ETHER.

Ether, three hundred and twenty-five cubic centimeters.....	325 Cc.
Alcohol, six hundred and seventy-five cubic centimeters.....	675 Cc.

To make one thousand cubic centimeters.....	1000 Cc.
---------------------------------------------	----------

Mix them.

SPIRITUS ÆTHERIS COMPOSITUS.

COMPOUND SPIRIT OF ETHER.

[HOFFMANN'S ANODYNE.]

Ether, three hundred and twenty-five cubic centimeters.....	325 Cc.
Alcohol, six hundred and fifty cubic centimeters.....	650 Cc.
Ethereal Oil, twenty-five cubic centimeters.....	25 Cc.

To make one thousand cubic centimeters....	1000 Cc.
--------------------------------------------	----------

Mix them.

SPIRITUS ÆTHERIS NITROSI.

SPIRIT OF NITROUS ETHER.

An alcoholic solution of Ethyl Nitrite [$\text{C}_2\text{H}_5\text{NO}_2 = 74.87$], yielding, when freshly prepared, and tested in a nitrometer, not less than 11 times its own volume of Nitrogen Dioxide [$\text{NO} = 29.97$].

Sodium Nitrite, <i>seven hundred and seventy grammes</i>	770 Gm.
Sulphuric Acid, <i>five hundred and twenty grammes</i>	520 Gm.
Sodium Carbonate, <i>ten grammes</i>	10 Gm.
Potassium Carbonate, completely deprived of water by drying, <i>thirty grammes</i>	30 Gm.
Deodorized Alcohol,	
Water, each, <i>a sufficient quantity</i> .	

Dissolve the Sodium Nitrite in *one thousand* (1000) *cubic centimeters* of Water, and put the solution into a suitable flask, connected with a condenser kept cold by ice-cold water ; then add *five hundred and fifty* (550) *cubic centimeters* of Deodorized Alcohol, and mix well. Through a cork fitted into the mouth of the flask insert a funnel-tube dipping below the surface of the liquid. With the condenser connect a receiver, and keep this surrounded by a mixture of common salt and crushed ice. Then gradually introduce into the flask, through the funnel-tube, the Sulphuric Acid previously diluted with *one thousand* (1000) *cubic centimeters* of Water. Distillation will usually commence before the whole of the Acid has been added. When all the Acid has been introduced, regulate the distillation by the application or withdrawal of a gentle heat until no more nitrous ether distils over. Wash the distillate, first, with *one hundred* (100) *cubic centimeters* of ice-cold Water to remove any alcohol which may have passed over, and then remove any traces of acid by washing the Ether with *one hundred* (100) *cubic centimeters* of ice-cold Water, in which the Sodium Carbonate had previously been dissolved. Carefully separate the Ether from the aqueous liquid, and agitate it, in a well-stoppered vial, with the Potassium Carbonate to remove traces of water. Then filter it through a pellet of cotton, in a covered funnel, into a tared bottle containing *two thousand* (2000) *cubic centimeters* of Deodorized Alcohol. Ascertain the weight of the Nitrous Ether filtered into the Alcohol by noting the increase of weight of the tared bottle and contents, and then add enough Deodorized Alcohol to make the mixture weigh *twenty-two* (22) *times* the weight of the Nitrous Ether added. Lastly, transfer the product to small, dark amber-colored, well-stoppered vials, and keep them in a cool place, remote from lights or fire.

A clear, mobile, volatile, and inflammable liquid of a pale yellowish or faintly greenish-yellow tint, having a fragrant, ethereal, and pungent odor free from acidity, and a sharp, burning taste.

Specific gravity : about 0.820 at 15° C. (59° F.).

When freshly prepared, or even after being kept for some time with but little exposure to light and air, it is neutral to litmus paper. When long kept, or after having been freely exposed to air and light, it acquires an acid reaction, but it should not effervesce when a crystal of potassium bicarbonate is dropped into it.

If a test-tube be half filled with the Spirit, and put into a water-bath heated to 65° C. (149° F.) until it has acquired this temperature, the Spirit should boil distinctly upon the addition of a few small pieces of broken glass.

If 10 Cc. of the Spirit be mixed with 5 Cc. of potassium hydrate T.S., previously diluted with 5 Cc. of water, the mixture will assume a yellow color which should not turn decidedly brown within twelve hours (limit of *aldehyde*).

If 5 Cc. of recently prepared Spirit of Nitrous Ether be introduced into a nitrometer, and followed, first, by 10 Cc. of potassium iodide T.S., and then by 10 Cc. of normal sulphuric acid, the volume of nitrogen dioxide generated at the ordinary indoor temperature (assumed to be at or near 25° C., or 77° F.) should not be less than 55 Cc. (corresponding to about 4 per cent. of pure ethyl nitrite).

SPIRITUS AMMONIÆ.

SPIRIT OF AMMONIA.

An alcoholic solution of Ammonia [$\text{NH}_3 = 17.01$] containing 10 per cent., by weight, of the gas.

Stronger Ammonia Water, *two hundred and fifty cubic centimeters* 250 Cc.

Alcohol, recently distilled, and, after distillation, kept in glass vessels, *a sufficient quantity*.

Pour the Stronger Ammonia Water into a flask provided with a safety funnel, and connected, by means of a glass condenser, with a well-cooled receiver containing *five hundred* (500) *cubic centimeters* of Alcohol, the delivery tube of the condenser reaching to near the bottom of the receiver. Heat the flask carefully, and very gradually, to a temperature not exceeding 60° C. (140° F.), and maintain it at that temperature for about ten minutes. Then disconnect the receiver, and, having ascertained the ammoniacal strength of the contents by means of normal sulphuric acid (rosolic acid test-solution being used as indicator), add enough Alcohol to make the product contain *ten* (10) *per cent.*, by weight, of Ammonia.

Keep the Spirit in glass-stoppered bottles, in a cool place.

A colorless liquid, having a strong odor of ammonia, and a specific gravity of about 0.810 at 15° C. (59° F.).

When diluted with water, it should respond to the tests for identity and purity mentioned under Ammonia Water (see *Aqua Ammoniac*).

If 3.4 Gm. (or 4.2 Cc.) of Spirit of Ammonia be diluted with water, it should require, for complete neutralization, 20 Cc. of normal sulphuric acid (each Cc. corresponding to 0.5 per cent. of Ammonia), rosolic acid being used as indicator.

SPIRITUS AMMONIÆ AROMATICUS.

AROMATIC SPIRIT OF AMMONIA.

Ammonium Carbonate, in translucent pieces, <i>thirty-four grammes</i>	34 Gm.
Ammonia Water, <i>ninety cubic centimeters</i>	90 Cc.
Oil of Lemon, <i>ten cubic centimeters</i>	10 Cc.
Oil of Lavender Flowers, <i>one cubic centimeter</i>	1 Cc.
Oil of Nutmeg, <i>one cubic centimeter</i>	1 Cc.
Alcohol, <i>seven hundred cubic centimeters</i>	700 Cc.
Distilled Water, <i>a sufficient quantity</i> ,	
<hr/>	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

To the Ammonia Water, contained in a flask, add *one hundred and forty* (140) *cubic centimeters* of Distilled Water, and afterwards the Ammonium Carbonate reduced to a moderately fine powder. Close the flask and agitate the contents until the Carbonate is dissolved. Introduce the Alcohol into a graduated bottle of suitable capacity, add the oils, then gradually add the solution of Ammonium Carbonate, and afterwards enough Distilled Water to make the product measure *one thousand* (1000) *cubic centimeters*. Set the liquid aside during twenty-four hours in a cool place, occasionally agitating, then filter it through paper, in a well-covered funnel.

Keep the product in glass-stoppered bottles, in a cool place.

A nearly colorless liquid when freshly prepared, but gradually acquiring a somewhat darker tint.

It has a pungent, ammoniacal odor and taste.

Specific gravity : about 0.905 at 15° C. (59° F.).

Preparations : Tinctura Guaiaci Ammoniata. Tinctura Valerianæ Ammoniata.

SPIRITUS AMYGDALÆ AMARÆ.

SPIRIT OF BITTER ALMOND.

[ESSENCE OF BITTER ALMOND.]

Oil of Bitter Almond, <i>ten cubic centimeters</i>	10 Cc.
Alcohol, <i>eight hundred cubic centimeters</i>	800 Cc.
Distilled Water, <i>a sufficient quantity</i> ,	
<hr/>	

To make *one thousand cubic centimeters*.... 1000 Cc.

Dissolve the Oil in the Alcohol, and add enough Distilled Water to make the product measure *one thousand* (1000) *cubic centimeters*.

SPIRITUS ANISI.**SPIRIT OF ANISE.**

Oil of Anise, <i>one hundred cubic centimeters</i>	100 Cc.
Deodorized Alcohol, <i>nine hundred cubic centimeters</i>	900 Cc.
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix them.

SPIRITUS AURANTII.**SPIRIT OF ORANGE.**

Oil of Orange Peel, <i>fifty cubic centimeters</i>	50 Cc.
Deodorized Alcohol, <i>nine hundred and fifty cubic centimeters</i>	950 Cc.
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix them.

SPIRITUS AURANTII COMPOSITUS.**COMPOUND SPIRIT OF ORANGE.**

Oil of Orange Peel, <i>two hundred cubic centimeters</i>	200 Cc.
Oil of Lemon, <i>fifty cubic centimeters</i>	50 Cc.
Oil of Coriander, <i>twenty cubic centimeters</i>	20 Cc.
Oil of Anise, <i>five cubic centimeters</i>	5 Cc.
Deodorized Alcohol, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix them. Keep the product in completely filled, well-stoppered bottles, in a cool and dark place.

Preparation: Elixir Aromaticum.

SPIRITUS CAMPHORÆ.**SPIRIT OF CAMPHOR.**

Camphor, <i>one hundred grammes</i>	100 Gm.
Alcohol, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Dissolve the Camphor in *eight hundred (800) cubic centimeters* of Alcohol, filter through paper, and pass enough Alcohol through the filter to make the product measure *one thousand (1000) cubic centimeters*.

SPIRITUS CHLOROFORMI.**SPIRIT OF CHLOROFORM.**

Chloroform, <i>sixty cubic centimeters</i>	60 Cc.
Alcohol, <i>nine hundred and forty cubic centimeters</i>	940 Cc.
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix them.

SPIRITUS CINNAMOMI.**SPIRIT OF CINNAMON.**

Oil of Cinnamon, <i>one hundred cubic centimeters</i>	100 Cc.
Alcohol, <i>nine hundred cubic centimeters</i>	900 Cc.
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix them.

SPIRITUS FRUMENTI.**WHISKEY.**

An alcoholic liquid obtained by the distillation of the mash of fermented grain (usually of mixtures of corn, wheat, and rye), and at least two years old.

An amber-colored liquid, having a distinctive odor and taste, and a slightly acid reaction.

Its specific gravity should not be more than 0.930, nor less than 0.917, corresponding, approximately, to an alcoholic strength of 44 to 50 per cent. by weight, or 50 to 58 per cent. by volume.

If 100 Cc. of Whiskey be very slowly evaporated in a tared capsule on a water-bath, the last portions volatilized should not have a harsh or disagreeable odor (absence of more than traces of *fusel oil from grain*) ; and the residue, when dried at 100° C. (212° F.), should not weigh more than 0.25 Gm. This residue should have no sweet or distinctly spicy taste (absence of *added sugar, glycerin, or aromatic substances*). It should almost completely dissolve in 10 Cc. of cold water, forming a solution which is colored not deeper than light green by a few drops of dilute ferric chloride T.S. made by mixing the latter with 10 volumes of water (absence of more than traces of *oak tannin* from casks).

To render 100 Cc. of Whiskey distinctly alkaline to litmus should not require more than 1.2 Cc. of potassium hydrate V.S. (limit of *free acid*).

SPIRITUS GAULTHERIÆ.**SPIRIT OF GAULTHERIA.**

Oil of Gaultheria, <i>fifty cubic centimeters</i>	50 Cc.
Alcohol <i>nine hundred and fifty cubic centimeters</i>	950 Cc.

To make *one thousand cubic centimeters* 1000 Cc.

Mix them.

SPIRITUS GLONOINI.

SPIRIT OF GLONONIN.

[SPIRIT OF NITROGLYCERIN.]

An alcoholic solution of Glonoin [Glyceryl (or Propenyl) trinitrate, or Nitroglycerin; $C_3H_5(NO_3)_3 = 226.58$], containing 1 per cent., by weight, of the substance.

Spirit of Glonoin should be kept and transported in well-stoppered tin cans, and should be stored in a cool place, remote from lights or fire.

Great care should be exercised in handling, packing, transporting, or storing the Spirit, since a dangerous explosion may result if any considerable quantity of it be spilled and the alcohol be partly or wholly lost by evaporation.

A clear, colorless liquid, possessing the odor and taste of alcohol. Caution should be exercised in tasting it, since even a small quantity of it is liable to produce a violent headache. The same effect is produced when it is freely applied to the skin.

It is neutral to litmus paper.

Specific gravity: 0.826 to 0.832 at 15° C. (59° F.).

On diluting 10 Cc. of the Spirit with 15 Cc. of water,—both liquids, as well as the mixture, when measured, being brought to 15° C. (59° F.),—the liquid will exhibit at most a faint cloudiness, but the addition of a further portion of 5 Cc. of water should produce a white turbidity.

If the specific gravity of the Spirit be higher than 0.840, or if 10 Cc. of it be rendered turbid by less than 10 Cc. of water, the Spirit should be rejected.

SPIRITUS JUNIPERI.

SPIRIT OF JUNIPER.

Oil of Juniper, <i>fifty cubic centimeters</i>	50 Cc.
------------------------------------------------------	--------

Alcohol, <i>nine hundred and fifty cubic centimeters</i>	950 Cc.
----------------------------------------------------------------	---------

To make <i>one thousand cubic centimeters</i>	1000 Cc.
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Mix them.

SPIRITUS JUNIPERI COMPOSITUS.

COMPOUND SPIRIT OF JUNIPER.

Oil of Juniper, <i>eight cubic centimeters</i>	8 Cc.
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Oil of Caraway, <i>one cubic centimeter</i>	1 Cc.
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Oil of Fennel, <i>one cubic centimeter</i>	1 Cc.
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Alcohol, <i>fourteen hundred cubic centimeters</i>	1400 Cc.
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Water, <i>a sufficient quantity</i> ,	
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To make <i>two thousand cubic centimeters</i>	2000 Cc.
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Dissolve the Oils in the Alcohol, and gradually add enough Water to make the product measure *two thousand (2000) cubic centimeters*.

SPIRITUS LAVANDULÆ.

SPIRIT OF LAVENDER.

Oil of Lavender Flowers, <i>fifty cubic centimeters</i>	50 Cc.
Deodorized Alcohol, <i>nine hundred and fifty cubic centimeters</i>	950 Cc.
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix them.

SPIRITUS LIMONIS.

SPIRIT OF LEMON.

[ESSENCE OF LEMON.]

Oil of Lemon, <i>fifty cubic centimeters</i>	50 Cc.
Lemon Peel, freshly grated, <i>fifty grammes</i>	50 Gm.
Deodorized Alcohol, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Dissolve the Oil of Lemon in *nine hundred (900) cubic centimeters* of Deodorized Alcohol, add the Lemon Peel, and macerate for twenty-four hours. Then filter through paper, and add, through the filter, enough Deodorized Alcohol to make the Spirit measure *one thousand (1000) cubic centimeters*.

SPIRITUS MENTHÆ PIPERITÆ.

SPIRIT OF PEPPERMINT.

[ESSENCE OF PEPPERMINT.]

Oil of Peppermint, <i>one hundred cubic centimeters</i>	100 Cc.
Peppermint, bruised, <i>ten grammes</i>	10 Gm.
Alcohol, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Dissolve the Oil of Peppermint in *nine hundred (900) cubic centimeters* of Alcohol, add the Peppermint, and macerate for twenty-four hours. Then filter through paper, and add, through the filter, enough Alcohol to make the Spirit measure *one thousand (1000) cubic centimeters*.

Preparation: Mistura Rhei et Sodæ.

SPIRITUS MENTHÆ VIRIDIS.

SPIRIT OF SPEARMINT.

[ESSENCE OF SPEARMINT.]

Oil of Spearmint, <i>one hundred cubic centimeters</i>	100 Cc.
Spearmint, bruised, <i>ten grammes</i>	10 Gm.
Alcohol, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Dissolve the Oil of Spearmint in *nine hundred (900) cubic centimeters* of Alcohol, add the Spearmint, and macerate for twenty-four hours. Then filter through paper, and add, through the filter, enough Alcohol to make the Spirit measure *one thousand (1000) cubic centimeters*.

SPIRITUS MYRCIÆ.

SPIRIT OF MYRCIA.

[BAY RUM.]

Oil of Myrcia, <i>sixteen cubic centimeters</i>	16 Cc.
Oil of Orange Peel, <i>one cubic centimeter</i>	1 Cc.
Oil of Pimenta, <i>one cubic centimeter</i>	1 Cc.
Alcohol, <i>twelve hundred and twenty cubic centimeters</i>	1220 Cc.
Water, <i>a sufficient quantity</i> ,	

To make *two thousand cubic centimeters*.... 2000 Cc.

Mix the Oils with the Alcohol, and gradually add Water until the solution measures *two thousand (2000) cubic centimeters*. Set the mixture aside, in a well-stoppered bottle, for eight days, then filter it through paper, in a well-covered funnel.

SPIRITUS MYRISTICÆ.

SPIRIT OF NUTMEG.

[ESSENCE OF NUTMEG.]

Oil of Nutmeg, <i>fifty cubic centimeters</i>	50 Cc.
Alcohol, <i>nine hundred and fifty cubic centimeters</i>	950 Cc.

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix them.

SPIRITUS PHOSPHORI.

SPIRIT OF PHOSPHORUS.

[TINCTURE OF PHOSPHORUS.]

Phosphorus, *one and two-tenths grammes* 1.2 Gm.Absolute Alcohol, *a sufficient quantity*,To make *one thousand cubic centimeters*. . . . 1000 Cc.

Weigh the Phosphorus in a tared capsule containing water, then dry it carefully and quickly with blotting paper, and introduce it into a flask containing *one thousand* (1000) *cubic centimeters* of Absolute Alcohol. Connect the flask with an upright condenser supplied with cold water, and apply the heat of a water-bath, so that the Alcohol may be kept gently boiling, until the Phosphorus is dissolved. Then allow the liquid to become cold, and, if necessary, add to it enough Absolute Alcohol to make it measure *one thousand* (1000) *cubic centimeters*. Lastly, transfer the Spirit to small, dark amber-colored vials, which should be securely stoppered, and kept in a cool and dark place.

Preparation: Elixir Phosphori.

SPIRITUS VINI GALLICI.

BRANDY.

An alcoholic liquid obtained by the distillation of the fermented, unmodified juice of fresh grapes, and at least four years old.

A pale amber-colored liquid, having a distinctive odor and taste, and a slightly acid reaction.

Its specific gravity should not be more than 0.941, nor less than 0.925, corresponding, approximately, to an alcoholic strength of 39 to 47 per cent. by weight, or 46 to 55 per cent. by volume.

If 100 Cc. of Brandy be very slowly evaporated in a tared capsule on a water-bath, the last portions volatilized should have an agreeable odor free from harshness (absence of *fusel oil from grain or potato spirit*); and the residue, when dried at 100° C. (212° F.), should not weigh more than 1.5 Gm. This residue should have no sweet or distinctly spicy taste (absence of *added sugar, glycerin, or aromatic substances*). It should almost completely dissolve in 10 Cc. of cold water, forming a solution which is colored not deeper than light green by a few drops of dilute ferric chloride T.S. made by mixing the latter with 10 volumes of water (absence of more than traces of *oak tannin* from casks).

To render 100 Cc. of Brandy distinctly alkaline to litmus should require not more than 1 Cc. of potassium hydrate V.S. (limit of *free acid*).

STAPHISAGRIA.

STAPHISAGRIA.

[STAVESACRE.]

The seed of *Delphinium Staphisagria* Linné (nat. ord. *Ranunculaceæ*).

About 5 Mm. long, 3 or 4 Mm. broad, flattish-tetrahedral, one side convex, brown or brownish-gray, with reticulate ridges, containing a whitish, oily albumen and a straight embryo; nearly inodorous; taste bitter and acrid.

STILLINGIA.

STILLINGIA.

[QUEEN'S ROOT.]

The root of *Stillingia sylvatica* Linné (nat. ord. *Euphorbiaceæ*).

About 30 Cm. long, and nearly 5 Cm. thick, subcylindrical, slightly branched, compact, wrinkled, tough, grayish-brown, breaking with a fibrous fracture, showing a thick bark and porous wood, the inner bark and medullary rays having numerous yellowish-brown resin-cells; odor peculiar, unpleasant; taste bitter, acrid, and pungent.

Preparation: Extractum Stillingiæ Fluidum.

STRAMONII FOLIA.

STRAMONIUM LEAVES.

The leaves of *Datura Stramonium* Linné (nat. ord. *Solanaceæ*).

About 15 Cm. long, petiolate, dark green, smooth, ovate, pointed, unequal, especially at the base, coarsely and sinuately toothed; thin, brittle, and nearly inodorous; taste unpleasant, bitter and nauseous.

STRAMONII SEMEN.

STRAMONIUM SEED.

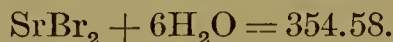
The seed of *Datura Stramonium* Linné (nat. ord. *Solanaceæ*).

About 4 Mm. long, reniform, flattened, pitted, and wrinkled; testa dull brownish-black, hard, inclosing a cylindrical, curved embryo, imbedded in a whitish, oily perisperm; of an unpleasant odor when bruised, and of an oily and bitter taste.

Preparations: Extractum Stramonii Seminis. Extractum Stramonii Seminis Fluidum. Tinctura Stramonii Seminis.

STRONTII BROMIDUM.

STRONTIUM BROMIDE.



Strontium Bromide should be kept in glass-stoppered vials.

Colorless, transparent, hexagonal crystals, odorless, and having a bitter, saline taste. Very deliquescent.

Soluble in 1.05 parts of water at 15° C. (59° F.), and in 0.5 part of boiling water. It is readily soluble in alcohol, and is precipitated from this solution upon the addition of an equal volume of ether, in which it is insoluble.

When heated, the crystals at first melt, and then lose all their water (30.4 per cent.). The anhydrous salt fuses at 630° C. (1166° F.).

To a non-luminous flame the salt communicates an intense, red color.

The aqueous solution is neutral to litmus paper.

With calcium sulphate T.S. the aqueous solution (1 in 20) slowly forms a white precipitate of strontium sulphate, insoluble in diluted acids; the same reaction occurs more quickly with diluted sulphuric acid, potassium sulphate T.S., and other soluble sulphates.

With potassium chromate T.S. it forms a yellow precipitate of strontium chromate, soluble in acetic acid.

With ammonium carbonate T.S., or sodium carbonate T.S., it forms a white precipitate of strontium carbonate, soluble, with effervescence, in acetic acid.

If a few drops of chloroform be added to 5 Cc. of the solution, then 1 Cc. of chlorine water, and the mixture shaken, the liberated bromine will dissolve in the chloroform, communicating to it a yellow or brownish-yellow color.

The aqueous solution (1 in 20) should not be affected by hydrogen sulphide T.S. either before or after acidulation with a drop of hydrochloric acid (absence of *arsenic, lead, copper*, etc.); nor by ammonium sulphide T. S. (absence of *iron, aluminum*, etc.).

It should form no precipitate with potassium dichromate T.S. (absence of *barium*).

If a few drops of starch T.S. be mixed with 5 Cc. of the aqueous solution, and then one or two drops of chlorine water added, no blue color should appear (absence of *iodine*).

If 0.3 Gm. of Strontium Bromide, rendered anhydrous by thorough drying before being weighed, be dissolved in 10 Cc. of water, and 3 drops of potassium dichromate T.S. be added, it should require not more than 24.6 Cc. of decinormal silver nitrate V.S. to produce a permanent red color (corresponding to at least 98 per cent. of the pure salt).

STRONTII IODIDUM.

STRONTIUM IODIDE.



Strontium Iodide should be kept in dark amber-colored, glass-stoppered vials.

Colorless, transparent, hexagonal plates, odorless, and having a bitterish, saline taste. Deliquescent, and colored yellow by exposure to air and light.

Soluble in 0.6 part of water at 15° C. (59° F.), and in 0.27 part of boiling water. Also soluble in alcohol, and slightly in ether.

When cautiously heated, the crystals melt and gradually lose their water (24.05 per cent.), becoming anhydrous. At a red heat, it is decomposed, losing iodine, and leaving a residue of strontium oxide.

To a non-luminous flame it communicates an intense, red color.

The aqueous solution is neutral, or very slightly acid, to litmus paper.

With calcium sulphate T.S. it slowly forms a white precipitate of strontium sulphate, insoluble in diluted acids; the same reaction occurs more quickly with diluted sulphuric acid, potassium sulphate T.S., or other soluble sulphates.

With potassium chromate T.S. it forms a yellow precipitate of strontium chromate, soluble in acetic acid.

With ammonium carbonate T.S., or sodium carbonate T.S., it forms a white precipitate of strontium carbonate, soluble, with effervescence, in acetic acid.

If a few drops of starch T.S. be added to 5 Cc. of the solution, and then 1 Cc. of chlorine water, a bluish-black color will appear.

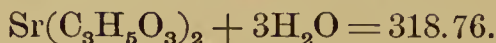
The aqueous solution (1 in 20) should not be affected by hydrogen sulphide T.S., either before or after acidulation with a drop of hydrochloric acid (absence of *arsenic, lead, copper*, etc.); nor by ammonium sulphide T.S. (absence of *iron, aluminum*, etc.).

No turbidity should be produced in the aqueous solution by potassium dichromate T.S. (absence of *barium*).

If 0.3 Gm. of Strontium Iodide, rendered anhydrous by thorough drying before being weighed, be dissolved in 10 Cc. of water and 3 drops of potassium dichromate T.S. be added, it should require not more than 18 Cc. of decinormal silver nitrate V.S. to produce a permanent red color (corresponding to at least 98 per cent. of the pure salt).

STRONTII LACTAS.

STRONTIUM LACTATE.



A white, granular powder, or crystalline nodules, odorless, and having a slightly bitter, saline taste. Permanent in the air.

Soluble in about 4 parts of water at 15° C. (59° F.), and in less than 0.5 part of boiling water. The solution saturated at a boiling heat remains liquid for many hours, even after being cooled to 0° C. (32° F.). Soluble in alcohol.

When heated to 110° C. (230° F.), the salt loses its water (16.9 per cent.). At a higher temperature it first fuses, then is decomposed, giving off inflammable vapors, and leaves a residue of strontium carbonate and carbon, which, on the addition of hydrochloric acid, effervesces and communicates an intense, red color to a non-luminous flame.

The aqueous solution (1 in 20) is slightly acid to litmus paper.

With calcium sulphate T.S. the solution slowly forms a white precipitate of strontium sulphate, insoluble in diluted acids. The same reaction occurs more quickly with diluted sulphuric acid, potassium sulphate T.S., or other soluble sulphates.

With potassium chromate T.S. it forms a yellow precipitate of strontium chromate, soluble in acetic acid.

With ammonium carbonate T.S., or sodium carbonate T.S., it forms a white precipitate of strontium carbonate, soluble, with effervescence, in acetic acid.

If to 5 Cc. of the solution (1 in 20) 1 Cc. of sulphuric acid be added, and then 1 Cc. of decinormal potassium permanganate V.S., the red color will rapidly disappear, while the mixture will effervesce and give off the odor of aldehyde.

If 1 Gm. of the salt be dissolved in 19 Cc. of water, it should form a perfectly clear, colorless solution, leaving no insoluble residue (absence of *carbonate*, *oxalate*, etc.).

The aqueous solution should not be affected by hydrogen sulphide T.S., either before or after acidulation with a drop of hydrochloric acid (absence of *arsenic*, *lead*, etc.); nor by ammonium sulphide T.S. (absence of *iron*, *aluminum*, etc.).

No turbidity should be produced in the solution by potassium dichromate T.S. (absence of *barium*).

If 0.5 Cc. of silver nitrate T.S. be added to 5 Cc. of the aqueous solution (1 in 20), not more than a slight opalescence should be perceptible (limit of *chloride*, etc.).

If 0.5 Gm. of the salt be placed upon a watch-glass, and 1 Cc. of sulphuric acid be carefully poured upon it, no effervescence should occur (absence of *carbonate*, *oxalate*, etc.); nor should any penetrating odor be perceptible, even after gentle heating (absence of *butyrate*, *propionate*, etc.); nor should the acid assume, within ten minutes, a deeper color than a pale straw-yellow (limit of *readily carbonizable*, *organic impurities*).

If 1.33 Gm. of the salt, rendered anhydrous, before being weighed, by careful drying at 110° C. (230° F.), be ignited, until most of the carbon has disappeared, and then distributed in 10 Cc. of water, it should require, for complete neutralization, not less than 9.9 Cc. of normal sulphuric acid (corresponding to at least 98.6 per cent. of the pure salt), methyl-orange being used as indicator.

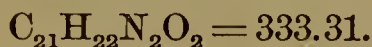
STROPHANTHUS.**STROPHANTHUS.**

The seed of *Strophanthus hispidus* De Candolle (nat. ord. *Apocynaceæ*), deprived of its long awn.

About 15 Min. long and 4 or 5 Min. broad, oblong-lanceolate, flattened and obtusely edged, grayish-green, covered with appressed, silky hairs, one side with a ridge extending into the attenuated, pointed end; kernel white and oily, consisting of a straight embryo, having two thin cotyledons, and surrounded by a thin layer of perisperm; nearly inodorous; taste very bitter.

A decoction prepared with 1 part of the seed and 10 parts of water has a brownish color, and is not changed in appearance on the addition of iodine T.S., ferric chloride T.S., or potassium mercuric iodide T.S.

Preparation: Tinctura Strophanthi.

STRYCHNINA.**STRYCHNINE.**

An alkaloid obtained from *Nux Vomica*, and also obtainable from other plants of the natural order *Loganiaceæ*.

Colorless, transparent, octohedral or prismatic crystals, or a white, crystalline powder, odorless, and having an intensely bitter taste perceptible even in highly dilute (1 in 700000) solution. Permanent in the air.

Soluble, at 15° C. (59° F.), in 6700 parts of water, and in 110 parts of alcohol; in 2500 parts of boiling water, and in 12 parts of boiling alcohol. Also soluble in 7 parts of chloroform, but almost insoluble in ether.

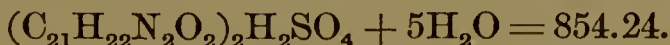
When heated to 268° C. (514.4° F.), Strychnine melts. Upon ignition it is consumed, leaving no residue.

Strychnine has an alkaline reaction upon litmus paper.

If a minute quantity of Strychnine be dissolved in about 0.5 Cc. of concentrated sulphuric acid on a white porcelain surface, and a small crystal of potassium dichromate slowly drawn across the liquid with a glass rod, there will be produced at first, momentarily, a blue color, which quickly changes to purplish-blue, then gradually to violet, purplish-red, and cherry-red, and finally to orange or yellow.

On dissolving 0.02 Gm. of Strychnine in 2 Cc. of nitric acid (specific gravity 1.300), in a small test-tube, the acid should not turn more than faintly yellow (limit of *brucine*).

Preparation: Ferri et Strychninæ Citras. Syrupus Ferri, Quininæ et Strychninæ Phosphatum.

STRYCHNINÆ SULPHAS.**STRYCHNINE SULPHATE.**

Strychnine Sulphate should be kept in well-stoppered vials.

Colorless or white, prismatic crystals, odorless, and having an intensely bitter taste perceptible even in highly dilute (1 in 700000) solution. Efflorescent in dry air.

Soluble, at 15° C. (59° F.), in 50 parts of water, and in 109 parts of alcohol; in 2 parts of boiling water, and in 8.5 parts of boiling alcohol. Almost insoluble in ether.

When heated at 100° C. (212° F.), the salt slowly loses its water of crystallization (10.51 per cent.); more rapidly when heated at 110° C. (230° F.). When quickly heated to 200° C. (392° F.), the salt fuses. Upon ignition, it is consumed, leaving no residue.

On adding potassium or sodium hydrate T.S. to an aqueous solution of the salt, a white precipitate is thrown down, which is insoluble in an excess of the alkali, and which should conform to the reactions and tests of strychnine (see *Strychnina*).

Barium chloride T.S. added to the aqueous solution throws down a white precipitate insoluble in hydrochloric acid.

On dissolving 0.05 Gm. of Strychnine Sulphate in 2 Cc. of nitric acid (specific gravity 1.300), in a small test-tube, the acid should not turn more than faintly yellow (limit of *brucine*).

STYRAX.

STORAX.

A balsam prepared from the inner bark of *Liquidambar orientalis* Miller (nat. ord. *Hamamelaceæ*).

A semi-liquid, gray, sticky, opaque mass, depositing, on standing, a heavier, dark brown stratum; transparent in thin layers, and having an agreeable odor and a balsamic taste.

Insoluble in water, but completely soluble (with the exception of accidental impurities) in an equal weight of warm alcohol.

If the alcoholic solution, which has an acid reaction, be cooled, filtered, and evaporated, it should leave not less than 70 per cent. of the original weight of the balsam, in the form of a brown, semi-liquid residue, almost completely soluble in ether and in carbon disulphide, but insoluble in benzin.

When heated on a water-bath, Storax becomes more fluid, and if it be then agitated with warm benzin, the supernatant liquid, on being decanted and allowed to cool, will be colorless, and will deposit white crystals of cinnamic acid and cinnamic ethers.

Preparation: Tinctura Benzoini Composita.

SULPHURIS IODIDUM.

SULPHUR IODIDE.

Washed Sulphur, <i>twenty grammes</i>	20 Gm.
Iodine, <i>eighty grammes</i>	80 Gm.

Mix the Sulphur and Iodine thoroughly by trituration; introduce the mixture into a flask, close the orifice loosely, and, by means of a water-bath, gradually and with occasional agitation apply a heat not exceeding 60° C. (140° F.), until the ingredients combine, and become of a uniformly dark color throughout. Then increase the heat to the boiling point of the water, so as to fuse the mass. Should any Iodine have sublimed and condensed on the glass, incline the flask so as to combine the Iodine with the fused mass, and then pour the latter out

upon a porcelain plate or other suitable cold surface. After cooling break the product into pieces of suitable size, and keep them in a glass-stoppered bottle, in a cool place.

Brittle masses of a crystalline fracture and a grayish-black, metallic lustre, having the odor of iodine, and a somewhat acid taste.

Almost insoluble in water; soluble in about 60 parts of glycerin; very soluble in carbon disulphide. Alcohol and ether dissolve out the iodine, leaving the sulphur. Continued boiling with water vaporizes all the iodine, leaving about 20 per cent. of sulphur as residue.

On exposing Sulphur Iodide to the air, it gradually loses iodine. On heating it, some iodine sublimes at first; at a somewhat higher temperature a sublimate is formed, containing both iodine and sulphur. At a still higher temperature, the whole is volatilized, leaving only a trace of residue.

SULPHUR LOTUM.

WASHED SULPHUR.

S = 31.98.

Sublimed Sulphur, *one hundred grammes* 100 Gm.

Ammonia Water, *ten cubic centimeters* 10 Cc.

Water, *a sufficient quantity*.

Pass the Sublimed Sulphur through a No. 30 sieve, mix it thoroughly with *one hundred (100) cubic centimeters* of Water, add *ten (10) cubic centimeters* of Ammonia Water, and digest for three days, agitating occasionally. Then add *one hundred (100) cubic centimeters* of Water, transfer the mixture to a muslin strainer, and wash the Sulphur with Water until the washings cease to impart a blue color to red litmus paper. Then allow it to drain, press the residue strongly, dry it rapidly at a moderate heat, and pass it through a No. 30 sieve.

A fine yellow powder, without odor or taste.

Insoluble in water; slightly soluble in absolute alcohol; more readily soluble in benzin, benzol, oil of turpentine, and many other oils; also in ether, in chloroform, and in boiling, aqueous solutions of alkaline hydrates. Carbon disulphide promptly dissolves a portion of it, but leaves a residue of insoluble sulphur, which may be dissolved by a boiling solution of an alkaline hydrate.

When heated to 115° C. (239° F.), Washed Sulphur melts, and at a higher temperature volatilizes, or, if air be admitted, burns to sulphur dioxide, which is identified by its characteristic odor, and by its blackening a strip of paper moistened with mercurous nitrate T.S. held in the gas.

The amount of residue left after volatilizing or igniting a weighed portion of it should not exceed 0.5 per cent.

If 0.5 Gm. of Washed Sulphur be boiled with 10 Cc. of sodium hydrate T.S., it should be completely dissolved, leaving no residue (absence of *earthy* or *metallic impurities*).

If 0.5 Gm. of Washed Sulphur be digested for several hours with 10 Cc. of ammonia water, the clear filtrate should not be colored yellow, nor be rendered turbid, by acidulation with hydrochloric acid, even after the addition of an equal volume of hydrogen sulphide T.S. (absence of *arsenic*).

If 5 Cc. of water be agitated with 2 Gm. of Washed Sulphur, the liquid should not change the color of blue or red litmus paper (absence of *acid*, and of *ammonia*).

If 0.5 Gm. of Washed Sulphur be boiled with a solution of 0.5 Gm. of potassium cyanide in 5 Cc. of water, and, after filtration, the clear liquid be acidulated with hydrochloric acid, it should not assume a reddish color, even after standing for an hour (absence of *selenium*).

Preparations : Pulvis Glycyrrhizæ Compositus. Unguentum Sulphuris.

SULPHUR PRÆCIPITATUM.

PRECIPITATED SULPHUR.

S = 31.98.

Sublimed Sulphur, *one hundred grammes* 100 Gm.
Lime, *fifty grammes* 50 Gm.
Hydrochloric Acid,
Water, each, *a sufficient quantity*.

Slake the Lime, and mix it uniformly with *five hundred* (500) *cubic centimeters* of Water. Add the Sublimed Sulphur, previously sifted, and, after thorough mixing, add *one thousand* (1000) *cubic centimeters* of Water, and boil the mixture during one hour, stirring constantly, and replacing the Water lost by evaporation. Then cover the vessel, and permit the contents to cool and to become clear by subsidence. Carefully draw off the clear solution, and filter the remainder. To the united liquids add gradually, and with constant stirring, Hydrochloric Acid, previously diluted with an equal volume of Water, until the liquid is nearly neutralized, still retaining, however, an alkaline reaction and a yellow color. Collect the precipitate on a strainer, and wash it, until the washings are tasteless and cease to give an acid reaction with litmus paper. Then dry the product rapidly, at a moderate heat, and keep it in well-stoppered bottles.

A fine, amorphous powder, of a pale yellow color, without odor or taste.

Insoluble in water ; very slightly soluble in absolute alcohol ; readily soluble in carbon disulphide ; also in benzin, benzol, oil of turpentine, and many other oils ; also in ether, in chloroform, and in boiling, aqueous solutions of alkaline hydrates.

At 115° C. (239° F.) Precipitated Sulphur melts, and at a higher temperature it volatilizes, or, if air be admitted, burns to sulphur dioxide, leaving no residue.

If 0.5 Gm. of Precipitated Sulphur be boiled with 10 Cc. of sodium hydrate T.S., it should be completely dissolved, leaving no residue (absence of *earthy* or *metallic impurities*).

If 1 Gm. of Precipitated Sulphur be digested for several hours with 10 Cc. of ammonia water, a portion of the clear filtrate should not leave any residue on evaporation ; nor should another portion be colored yellow, or rendered turbid, by acidulation with hydrochloric acid, even after the addition of an equal volume of hydrogen sulphide T.S. (absence of *arsenic*).

If 5 Cc. of water be agitated with 2 Gm. of Precipitated Sulphur, the liquid should not change the color of blue or red litmus paper (absence of *acid* or

alkali); nor should it leave any residue on evaporation (absence of *soluble impurities*).

If 0.5 Gm. of Precipitated Sulphur be boiled with a solution of 0.5 Gm. of potassium cyanide in 5 Cc. of water, and, after filtration, the clear liquid be acidulated with hydrochloric acid, it should not assume a reddish color, even after standing for an hour (absence of *selenium*).

SULPHUR SUBLIMATUM.

SUBLIMED SULPHUR.

S = 31.98.

A fine, yellow powder, having a slight, characteristic odor, and a faintly acid taste.

Insoluble in water; slightly soluble in absolute alcohol; more readily soluble in benzin, benzol, oil of turpentine, and many other oils; also in ether, in chloroform, and in boiling, aqueous solutions of alkaline hydrates.

Carbon disulphide promptly dissolves a portion of it, but leaves a residue of crystalline sulphur, which may be dissolved by a boiling solution of an alkaline hydrate.

At 115° C. (239° F.) it melts, and at a higher temperature it volatilizes, or, if air be admitted, burns to sulphur dioxide, characterized by its odor, and by its blackening a strip of paper moistened with mercurous nitrate T.S. held in the gas.

When agitated with water, the latter gives an acid reaction with litmus paper.

The amount of residue left after volatilizing or burning a weighed portion of it should not exceed 0.5 per cent.

Preparations: Sulphur Lotum. Sulphur Præcipitatum.

SUMBUL.

SUMBUL.

The root of *Ferula Sumbul* (Kauffmann) Hooker filius (nat. ord. *Umbelliferae*).

In transverse segments, varying in diameter from about 2 to 7 Cm., and in length from 15 to 30 Mm.; light, spongy, annulate or longitudinally wrinkled; bark thin, brown, more or less bristly fibrous; the interior whitish, with numerous brownish-yellow resin-dots and irregular, easily separated fibres; odor strong, musk-like; taste bitter and balsamic.

Preparation: Tinctura Sumbul.

SUPPOSITORIA.

SUPPOSITORIES.

Take of

The Medicinal Ingredient, *the prescribed quantity*,

Oil of Theobroma, *a sufficient quantity*.

Having weighed out the medicinal ingredient or ingredients, and the quantity of Oil of Theobroma required according to the kind of Suppository to be prepared (see below), mix the medicinal portion

(previously brought to a proper consistence, if necessary) with a small quantity of the Oil of Theobroma, by rubbing them together, and add the mixture to the remainder of the Oil of Theobroma, previously melted and cooled to the temperature of 35° C. (95° F.). Then mix thoroughly, without applying more heat, and immediately pour the mixture into suitable moulds. The moulds must be kept cold by being placed on ice, or by immersion in ice-cold water, before the melted mass is poured in.

In the absence of suitable moulds, Suppositories may be formed by allowing the mixture, prepared as above, to cool, care being taken to keep the ingredients well mixed, and dividing the mass into parts, of a definite weight each, of the proper shape.

Unless otherwise specified, Suppositories should have the following weights and shapes, corresponding to their several uses :

Rectal Suppositories should be cone-shaped, and of a weight of about one (1) gramme.

Urethral Suppositories should be pencil-shaped, and of a weight of about one (1) gramme.

Vaginal Suppositories should be globular, and of a weight of about three (3) grammes.

SUPPOSITORIA GLYCERINI.

SUPPOSITORIES OF GLYCERIN.

Glycerin, <i>sixty grammes</i>	60 Gm.
Sodium Carbonate, <i>three grammes</i>	3 Gm.
Stearic Acid, <i>five grammes</i>	5 Gm.
To make <i>ten rectal suppositories</i>	10

Dissolve the Sodium Carbonate in the Glycerin in a capsule on a water-bath ; then add the Stearic Acid, and heat carefully until this is dissolved, and the escape of carbonic acid gas has ceased. Then pour the melted mass into suitable moulds, remove the suppositories when they are cold, and wrap each in tin-foil.

These suppositories should be freshly prepared when required.

SYRUPUS.

SYRUP.

Sugar, in coarse powder, <i>eight hundred and fifty grammes</i> ..	850 Gm.
Distilled Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* 1000 Cc.

Dissolve the Sugar, with the aid of heat, in *four hundred and fifty* (450) *cubic centimeters* of Distilled Water, raise the temperature to the boiling point, strain the liquid, and pass enough Distilled Water through the strainer to make the product, when cold, measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

Syrup may also be prepared in the following manner :

Press down into the neck of a percolator or funnel of suitable size a tapering piece of coarse, well-cleaned sponge, not too tightly, and in such a manner that the whole sponge shall be within the neck of the percolator, its upper end being about half an inch below its commencement. Place the Sugar into the apparatus, make its surface level without shaking or jarring, then carefully pour on *four hundred and fifty* (450) *cubic centimeters* of Distilled Water, and regulate the flow of the liquid, if necessary, so that it will pass out in rapid drops. Return the first portions of the percolate, until it runs through clear, and, when all the liquid has passed, follow it by Distilled Water, added in portions, so that all the Sugar may be dissolved, and the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

Syrup thus prepared has a specific gravity of about 1.317.

Preparations : Compound Syrups, etc.

SYRUPUS ACACIÆ.

SYRUP OF ACACIA.

Mucilage of Acacia, recently prepared, <i>twenty-five cubic centimeters</i>	25 Cc.
Syrup <i>seventy-five cubic centimeters</i>	75 Cc.
To make <i>one hundred cubic centimeters</i>	100 Cc.

Mix them.

This syrup should be freshly prepared, when required.

SYRUPUS ACIDI CITRICI.

SYRUP OF CITRIC ACID.

Citric Acid, <i>ten grammes</i>	10 Gm.
Water, <i>ten cubic centimeters</i>	10 Cc.
Spirit of Lemon, <i>ten cubic centimeters</i>	10 Cc.
Syrup, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Dissolve the Citric Acid in the Water, and mix the solution with *ve hundred* (500) *cubic centimeters* of Syrup. Then add the Spirit of Lemon, and, lastly, enough Syrup to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

SYRUPUS ACIDI HYDRIODICI.

SYRUP OF HYDRIODIC ACID.

A syrupy liquid containing about 1 per cent., by weight, of absolute Hydriodic Acid [$\text{HI} = 127.53$], or about 1.3 Gm. in 100 Cc.

Potassium Iodide, <i>thirteen grammes</i>	13 Gm.
Potassium Hypophosphite, <i>one gramme</i>	1 Gm.
Tartaric Acid, <i>twelve grammes</i>	12 Gm.
Water, <i>fifteen cubic centimeters</i>	15 Cc.
Diluted Alcohol,	
Syrup, each, <i>a sufficient quantity</i> ,	

To make *one thousand grammes*.... 1000 Gm.

Dissolve the two Potassium salts in the Water, and the Tartaric Acid in *twenty-five* (25) *cubic centimeters* of Diluted Alcohol. Mix the two solutions in a vial, shake it thoroughly, and place it in ice-water for half an hour, occasionally shaking. Then filter the mixture through a small, rapidly-acting, white filter, and carefully wash the vial and filter with Diluted Alcohol, until the filtrate ceases to produce more than a faint cloudiness when a drop or two is allowed to fall into silver nitrate test-solution. Reduce the filtrate, by evaporation in a tared capsule, on a water-bath, to *fifty* (50) *grammes*, and mix it, when cold, with enough Syrup to make the product weigh *one thousand* (1000) *grammes*.

A transparent, colorless, or not more than pale straw-colored liquid, odorless, and having a sweet and acidulous taste.

Specific gravity : about 1.313 at 15° C. (59° F.).

If a small portion of the Syrup be mixed with a little starch T.S., and a few drops of chlorine water then added, the liquid will acquire a deep blue color. Not more than a faint bluish tint should be produced in the Syrup by starch T.S. alone (limit of *free iodine*).

The addition of silver nitrate T.S. to a small portion of the Syrup produces a pale yellow precipitate, nearly insoluble in ammonia water.

If 32 (31.88) Gm. of the Syrup be exactly neutralized by ammonia water, and then mixed with 2 drops of potassium chromate T.S., it should require about 25 Cc. of decinormal silver nitrate V.S. to produce a permanent red tint (corresponding to about 1 per cent. of absolute Hydriodic Acid).

SYRUPUS ALLII.

SYRUP OF GARLIC.

Fresh Garlic, sliced and bruised, <i>two hundred grammes</i> ..	200 Gm.
Sugar, <i>eight hundred grammes</i>	800 Gm.
Diluted Acetic Acid, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Macerate the Garlic with *three hundred* (300) *cubic centimeters* of Diluted Acetic Acid during four days, and express the liquid, avoiding the use of metallic utensils. Then mix the residue with *two hundred*

(200) *cubic centimeters* more of Diluted Acetic Acid, and again express. Mix the expressed liquids, and filter. Pour the filtrate upon the Sugar, contained in a suitable vessel, and stir or agitate until the Sugar is dissolved. Lastly, add enough Diluted Acetic Acid to make the product measure *one thousand* (1000) *cubic centimeters*, and mix thoroughly.

Keep the Syrup in well-stoppered, completely filled bottles, in a cool place.

Syrup of Garlic may also be prepared in the following manner :

Prepare a percolator or funnel in the manner described under Syrup (see *Syrupus*). Pour the filtrate obtained as directed in the preceding formula upon the Sugar, return the first portions of the percolate, until it runs through clear, and, when all the liquid has passed, follow it by Diluted Acetic Acid, until the product measures *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

SYRUPUS ALTHÆÆ.

SYRUP OF ALTHÆA.

Althæa, cut into small pieces, <i>fifty grammes</i>	50 Gm.
Alcohol, <i>thirty cubic centimeters</i>	30 Cc.
Glycerin, <i>one hundred cubic centimeters</i>	100 Cc.
Sugar, <i>seven hundred grammes</i>	700 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Wash the Althæa with cold Water, then macerate it with *four hundred* (400) *cubic centimeters* of Water previously mixed with the Alcohol, during one hour, stirring frequently, and strain without expressing the residue. In the strained liquid dissolve the Sugar by agitation, without heat, add the Glycerin, and enough Water to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

Keep the Syrup in well-stoppered, completely filled bottles, in a cool place.

SYRUPUS AMYGDALÆ.

SYRUP OF ALMOND.

Sweet Almond, <i>one hundred and forty grammes</i>	140 Gm.
Bitter Almond, <i>forty grammes</i>	40 Gm.
Sugar, <i>two hundred grammes</i>	200 Gm.
Orange Flower Water, <i>one hundred cubic centimeters</i> ...	100 Cc.
Water, <i>one hundred and thirty cubic centimeters</i>	130 Cc.
Syrup, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Rub the Almonds, previously blanched, in a mortar with *one hundred* (100) *grammes* of the Sugar and *thirty* (30) *cubic centimeters* of Water to a smooth paste. Mix this well with the Orange Flower Water and *two hundred* (200) *cubic centimeters* of Syrup, and strain with strong expression. To the residue add *one hundred* (100) *cubic centimeters* of Water, and express again. In the strained liquid dissolve the remainder of the Sugar, without heat, adding enough Syrup to make the product measure *one thousand* (1000) *cubic centimeters*.

Keep the Syrup in well-stoppered, completely filled bottles, in a cool place.

SYRUPUS AURANTII.

SYRUP OF ORANGE.

Sweet Orange Peel, taken from the fresh fruit, <i>fifty</i> <i>grammes</i>	50 Gm.
Precipitated Calcium Phosphate, <i>fifty grammes</i>	50 Gm.
Sugar, <i>seven hundred grammes</i>	700 Gm.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Introduce the Sweet Orange Peel (which should be as free as possible from the white, inner layer, and cut into small shreds) into a flask, and add *eighty* (80) *cubic centimeters* of Alcohol. Stopper the flask loosely with a notched cork, apply the heat of a water-bath until the Alcohol boils, and maintain it boiling during five minutes. Then stopper the flask well, and set it aside to cool. Filter off the liquid, and wash the filter and contents with Alcohol until the filtrate measures *one hundred* (100) *cubic centimeters*. Mix the Precipitated Calcium Phosphate, in a mortar, with *one hundred and fifty* (150) *grammes* of Sugar, and add the tincture with constant trituration. To the resulting, pasty mass add *three hundred* (300) *cubic centimeters* of Water, triturating constantly, transfer the whole to a filter, and return the first portions of the filtrate, if necessary, until it runs through clear. In the filtrate dissolve the remainder of the Sugar, and add enough Water, through the filter, to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

SYRUPUS AURANTII FLORUM.

SYRUP OF ORANGE FLOWERS.

Sugar, <i>eight hundred and fifty grammes</i>	850 Gm.
Orange Flower Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Dissolve the Sugar in *four hundred and fifty* (450) *cubic centimeters* of Orange Flower Water by agitation, without heat, add enough Orange Flower Water to make the product measure *one thousand* (1000) *cubic centimeters*, and mix thoroughly.

Syrup of Orange Flowers may also be prepared in the following manner :

Prepare a percolator or funnel in the manner described under Syrup (see *Syrupus*). Pour *four hundred and fifty* (450) *cubic centimeters* of Orange Flower Water upon the Sugar, return the first portions of the percolate until it runs through clear, and, when all the liquid has passed, follow it by Orange Flower Water, until the product measures *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

SYRUPUS CALCII LACTOPHOSPHATIS.

SYRUP OF CALCIUM LACTOPHOSPHATE.

Precipitated Calcium Carbonate, <i>twenty-five grammes</i> ..	25 Gm.
Lactic Acid, <i>sixty cubic centimeters</i>	60 Cc.
Phosphoric Acid, <i>thirty-six cubic centimeters</i>	36 Cc.
Orange Flower Water, <i>twenty-five cubic centimeters</i>	25 Cc.
Sugar, <i>seven hundred grammes</i>	700 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

To the Lactic Acid mixed with *one hundred* (100) *cubic centimeters* of Water, and contained in a capacious mortar, gradually add the Calcium Carbonate, in portions, until it is dissolved. Then add the Phosphoric Acid, and triturate until the precipitate at first formed is dissolved. Add *one hundred and fifty* (150) *cubic centimeters* of Water, and filter, rinsing the mortar with *seventy-five* (75) *cubic centimeters* of Water, and passing the rinsings through the filter. To the mixed filtrates add the Orange Flower Water, and, having added the Sugar, dissolve it by agitation, without heat, and strain. Lastly, pass enough Water through the strainer to make the product measure *one thousand* (1000) *cubic centimeters*, and mix thoroughly.

SYRUPUS CALCIS.

SYRUP OF LIME.

Lime, <i>sixty-five grammes</i>	65 Gm.
Sugar, <i>four hundred grammes</i>	400 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Triturate the Lime and Sugar thoroughly in a mortar, so as to form a homogeneous powder; then add the mixture to *five hundred* (500) *cubic centimeters* of boiling Water, contained in a bright copper or tinned iron vessel, boil for five minutes, constantly stirring, and then strain. Dilute the strained liquid with an equal volume of Water, and filter through white paper. Then evaporate the filtrate, in a tared capsule, to *seven hundred* (700) *grammes*, allow it to cool, add to it enough Water to make the product measure *one thousand* (1000) *cubic centimeters*, and mix thoroughly.

Keep the Syrup in well-stoppered bottles.

SYRUPUS FERRI IODIDI.

SYRUP OF FERROUS IODIDE.

A syrupy liquid containing about 10 per cent., by weight, of Ferrous Iodide [$\text{FeI}_2 = 308.94$], or about 13.4 Gm. in 100 Cc.

Iron, in the form of fine bright wire, and cut into small pieces, <i>twenty-five grammes</i>	25 Gm.
Iodine, <i>eighty-three grammes</i>	83 Gm.
Syrup,	
Distilled Water, each, <i>a sufficient quantity</i> ,	
To make <i>one thousand grammes</i>	1000 Gm.

Introduce the Iron into a flask of thin glass, having a capacity of about *five hundred* (500) *cubic centimeters*, add to it *one hundred and fifty* (150) *cubic centimeters* of Distilled Water, and afterwards the Iodine. Shake the mixture occasionally, checking the reaction, if necessary, by the affusion of cold water, and, when the solution has acquired a greenish color, and has lost the odor of Iodine, heat it to boiling. Then filter it through a strong, double, rapidly-acting filter placed in a funnel, the point of which dips below the surface of *six hundred* (600) *grammes* of Syrup contained in a tared vessel. When the liquid has run through, wash the flask and filter with a mixture of *twenty-five* (25) *cubic centimeters*, each, of Syrup and Distilled Water, previously raised to near 100° C. (212° F.), then withdraw the funnel, add enough Syrup to make the product weigh *one thousand* (1000) *grammes*, and mix thoroughly.

Keep the Syrup in small, well-stoppered, and completely filled bottles.

A transparent, pale green liquid, having a sweet, strongly ferruginous taste, and a neutral reaction.

Specific gravity: about 1.353 at 15° C. (59° F.).

On adding a few drops of potassium ferricyanide T.S. to a small portion of the Syrup, a blue precipitate will be produced.

If mixed with a little starch T.S., and afterwards with a few drops of chlorine water, the Syrup will acquire a deep blue color. This color should not be produced in the Syrup by starch T.S. alone (absence of *free iodine*).

If 1.55 Gm. (1.5447 Gm.) of the Syrup and 10 Cc. of water be introduced into a flask, and the liquid mixed, successively, with 11 Cc. of decinormal silver nitrate V.S., and 5 Cc., each, of diluted nitric acid and ferric ammonium sulphate T.S., it should not require more than about 1 Cc. of decinormal potassium sulphocyanate V.S. to produce a reddish-brown tint which persists after shaking (corresponding to about 10 per cent. of Ferrous Iodide).

SYRUPUS FERRI, QUININÆ ET STRYCHNINÆ PHOSPHATUM.

SYRUP OF THE PHOSPHATES OF IRON, QUININE, AND STRYCHNINE.

Soluble Ferric Phosphate, <i>twenty grammes</i>	20	Gm.
Quinine Sulphate, <i>thirty grammes</i>	30	Gm.
Strychnine, <i>two-tenths of a gramme</i>	0.2	Gm.
Phosphoric Acid, <i>forty-eight cubic centimeters</i>	48	Cc.
Glycerin, <i>one hundred cubic centimeters</i>	100	Cc.
Water, <i>fifty cubic centimeters</i>	50	Cc.
Syrup, <i>a sufficient quantity</i> ,		

To make *one thousand cubic centimeters*.... 1000 Cc.

Heat the Soluble Ferric Phosphate with the Water, in a porcelain capsule, until it is dissolved. Then add the Phosphoric Acid, the Quinine Sulphate, and the Strychnine, and stir, until solution is effected. Filter the liquid into the Glycerin, contained in a graduated bottle, add enough Syrup to make up the volume to *one thousand* (1000) *cubic centimeters*, and mix thoroughly. Lastly, strain, if necessary.

SYRUPUS HYPOPHOSPHITUM.

SYRUP OF HYPOPHOSPHITES.

Calcium Hypophosphite, <i>forty-five grammes</i>	45	Gm.
Potassium Hypophosphite, <i>fifteen grammes</i>	15	Gm.
Sodium Hypophosphite, <i>fifteen grammes</i>	15	Gm.
Diluted Hypophosphorous Acid, <i>two grammes</i>	2	Gm.
Sugar, <i>five hundred grammes</i>	500	Gm.
Spirit of Lemon, <i>five cubic centimeters</i>	5	Cc.
Water, <i>a sufficient quantity</i> ,		

To make *one thousand cubic centimeters*.... 1000 Cc.

Triturate the Hypophosphites with *four hundred and fifty* (450) *cubic centimeters* of Water, until they are dissolved, add the Spirit of Lemon,

and the Hypophosphorous Acid, and filter the liquid. In the filtrate dissolve the Sugar by agitation, without heat, and add enough Water, through the filter, to make the product measure *one thousand* (1000) *cubic centimeters*. Strain, if necessary.

Syrup of Hypophosphites may also be prepared in the following manner :

Prepare a percolator or funnel in the manner described under Syrup (see *Syrupus*). Pour the filtrate obtained as directed in the preceding formula upon the Sugar, return the first portions of the percolate, until it runs through clear, and, when all the liquid has passed, follow it by Water, until the product measures *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

Preparation : Syrupus Hypophosphitum cum Ferro.

SYRUPUS HYPOPHOSPHITUM CUM FERRO.

SYRUP OF HYPOPHOSPHITES WITH IRON.

Ferrous Lactate, *ten grammes*..... 10 Gm.

Potassium Citrate, *ten grammes*..... 10 Gm.

Syrup of Hypophosphites, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Rub the Ferrous Lactate and Potassium Citrate with a small quantity of the Syrup, gradually added, until they are dissolved. Then strain, and add enough Syrup of Hypophosphites to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

This preparation should be freshly made, when wanted.

SYRUPUS IPECACUANHÆ.

SYRUP OF IPECAC.

Fluid Extract of Ipecac, *seventy cubic centimeters*..... 70 Cc.

Acetic Acid, *ten cubic centimeters* 10 Cc.

Glycerin, *one hundred cubic centimeters* 100 Cc.

Sugar, *seven hundred grammes* 700 Gm.

Water, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Dilute the Fluid Extract of Ipecac with *three hundred* (300) *cubic centimeters* of Water to which the Acetic Acid had previously been added, and mix them thoroughly by shaking. Then filter, and pass enough water through the filter to obtain *five hundred* (500) *cubic centimeters* of filtrate. To this liquid add the Glycerin, dissolve the Sugar in the mixture, and add enough Water to make the product

measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly, and strain, if necessary.

Syrup of Ipecac may also be prepared in the following manner :

Prepare a percolator or funnel in the manner described under *Syrup* (see *Syrupus*). Mix the filtrate obtained as directed in the preceding formula with the Glycerin, pour the mixture upon the Sugar, return the first portions of the percolate, until it runs through clear, and, when all the liquid has passed, follow it by Water, until the product measures *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

SYRUPUS KRAMERIÆ.

SYRUP OF KRAMERIA.

Fluid Extract of <i>Krameria</i> , <i>four hundred and fifty cubic centimeters</i>	450 Cc.
Syrup, <i>five hundred and fifty cubic centimeters</i>	550 Cc.
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix them.

SYRUPUS LACTUCARII.

SYRUP OF LACTUCARIUM.

Tincture of <i>Lactucarium</i> , <i>one hundred cubic centimeters</i>	100 Cc.
Precipitated Calcium Phosphate, <i>fifty grammes</i>	50 Gm.
Sugar, <i>seven hundred and fifty grammes</i>	750 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* 1000 Cc.

Triturate the Precipitated Calcium Phosphate and *one hundred and fifty* (150) *grammes* of the Sugar, in a mortar, with the Tincture of *Lactucarium* gradually added, and afterwards with *three hundred* (300) *cubic centimeters* of Water, added in small portions at a time. Filter the mixture, dissolve the remainder of the Sugar in the filtrate, and pass enough Water through the filter to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

Syrup of Lactucarium may also be prepared in the following manner :

Prepare a percolator or funnel in the manner described under *Syrup* (see *Syrupus*). Pour the filtrate obtained as directed in the preceding formula upon the Sugar, return the first portions of the percolate, until it runs through clear, and, when all the liquid has passed, follow it by Water, until the product measures *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

SYRUPUS PICIS LIQUIDÆ.

SYRUP OF TAR.

Tar, <i>seventy-five grammes</i>	75 Gm.
Water, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
Boiling Distilled Water, <i>four hundred cubic centimeters</i> ..	400 Cc.
Glycerin, <i>one hundred cubic centimeters</i>	100 Cc.
Sugar, <i>eight hundred grammes</i>	800 Gm.
Distilled Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Tar intimately with about *one hundred* (100) *grammes* of white sand, pour on the Water, and stir frequently during twelve hours; then pour off the Water and throw it away. Pour the Boiling Distilled Water upon the residue, stir well and frequently during fifteen minutes, add the Glycerin, and set the vessel aside for twenty-four hours, occasionally stirring. Decant the clear solution, and filter. Dissolve the Sugar in the filtrate with the aid of a gentle heat; allow the liquid to cool, then strain it, and pass enough Distilled Water through the strainer to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

SYRUPUS PRUNI VIRGINIANÆ.

SYRUP OF WILD CHERRY.

Wild Cherry, in No. 20 powder, <i>one hundred and fifty grammes</i>	150 Gm.
Sugar, <i>seven hundred grammes</i>	700 Gm.
Glycerin, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Glycerin with *three hundred* (300) *cubic centimeters* of Water. Moisten the Wild Cherry with a sufficient quantity of the liquid, and macerate for twenty-four hours in a close vessel; then pack it firmly in a cylindrical percolator, and pour on the remainder of the menstruum. When the liquid has disappeared from the surface, follow it by Water, until the percolate measures *four hundred and fifty* (450) *cubic centimeters*. Dissolve the Sugar in the percolate by agitation, without heat, strain, and pass enough Water through the strainer to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

Syrup of Wild Cherry may also be prepared in the following manner :

Prepare a percolator or funnel in the manner described under *Syrup* (see *Syrupus*). Pour the percolate obtained as directed in the preceding formula upon the Sugar, return the first portions of the percolate, until it runs through clear, and, when all the liquid has passed, follow it by Water, until the product measures *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

SYRUPUS RHEI.

SYRUP OF RHUBARB.

Fluid Extract of Rhubarb, <i>one hundred cubic centimeters</i>	100 Cc.
Spirit of Cinnamon, <i>four cubic centimeters</i>	4 Cc.
Potassium Carbonate, <i>ten grammes</i>	10 Gm.
Glycerin, <i>fifty cubic centimeters</i>	50 Cc.
Water, <i>fifty cubic centimeters</i>	50 Cc.
Syrup, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix the Spirit of Cinnamon with the Fluid Extract of Rhubarb, and add to it the Potassium Carbonate dissolved in the Water. Then add the Glycerin, and, lastly, enough Syrup to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

SYRUPUS RHEI AROMATICUS.

AROMATIC SYRUP OF RHUBARB.

Aromatic Tincture of Rhubarb, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
Syrup, <i>eight hundred and fifty cubic centimeters</i>	850 Cc.

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix them.

SYRUPUS ROSÆ.

SYRUP OF ROSE.

Fluid Extract of Rose, <i>one hundred and twenty-five cubic centimeters</i>	125 Cc.
Syrup, <i>eight hundred and seventy-five cubic centimeters</i>	875 Cc.

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix them.

SYRUPUS RUBI.

SYRUP OF RUBUS.

Fluid Extract of Rubus, <i>two hundred and fifty cubic centimeters</i>	250 Cc.
Syrup, <i>seven hundred and fifty cubic centimeters</i>	750 Cc.
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix them.

SYRUPUS RUBI IDÆI.

SYRUP OF RASPBERRY.

Fresh, Ripe Raspberries, *any convenient quantity*,
Sugar, *a sufficient quantity*.

Reduce the Raspberries to a pulp, and let this stand, at a temperature of about 20° C. (68° F.), until a small portion of the filtered juice mixes clear with half its volume of alcohol. Then separate the juice by pressing, set it aside, in a cool place, until the liquid portion has become clear, and filter. To every *forty* (40) *parts* by weight of the filtrate (which should not be allowed to remain, unprotected by sugar, more than about two hours) add *sixty* (60) *parts* of Sugar, heat the mixture to boiling, avoiding the use of tinned vessels, and strain. Keep the product in well-stoppered bottles, in a cool and dark place.

On shaking separate portions of Syrup of Raspberries with ether, chloroform, or amylic alcohol, no color should be imparted to these liquids (absence of foreign coloring matters).

SYRUPUS SARSAPARILLÆ COMPOSITUS.

COMPOUND SYRUP OF SARSAPARILLA.

Fluid Extract of Sarsaparilla, <i>two hundred cubic centimeters</i>	200	Cc.
Fluid Extract of Glycyrrhiza, <i>fifteen cubic centimeters</i>	15	Cc.
Fluid Extract of Senna, <i>fifteen cubic centimeters</i>	15	Cc.
Sugar, <i>six hundred and fifty grammes</i>	650	Gm.
Oil of Sassafras, <i>one-tenth cubic centimeter</i>	0.1	Cc.
Oil of Anise, <i>one-tenth cubic centimeter</i>	0.1	Cc.
Oil of Gaultheria, <i>one-tenth cubic centimeter</i>	0.1	Cc.
Water, <i>a sufficient quantity</i> ,		

To make *one thousand cubic centimeters*.... 1000 Cc.

Add the Oils (equivalent to about *two* (2) *drops*, each) to the mixed Fluid Extracts, and shake the liquid thoroughly. Then add enough

Water to make up the volume to *six hundred* (600) *cubic centimeters*, and mix well. Set the mixture aside for one hour, then filter it. Dissolve the Sugar in the filtrate with the aid of a gentle heat, allow the liquid to cool, strain, and add enough Water, through the strainer, to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

SYRUPUS SCILLÆ.

SYRUP OF SQUILL.

Vinegar of Squill, <i>four hundred and fifty cubic centimeters</i>	450 Cc.
Sugar, <i>eight hundred grammes</i>	800 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Heat the Vinegar of Squill to the boiling point, in a glass or porcelain vessel, and filter the liquid while it is hot. Dissolve the Sugar in the hot filtrate by agitation, without further heating, strain, and, when the strained liquid is cold, add enough Water, through the strainer, to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

SYRUPUS SCILLÆ COMPOSITUS.

COMPOUND SYRUP OF SQUILL.

Fluid Extract of Squill, <i>eighty cubic centimeters</i>	80 Cc.
Fluid Extract of Senega, <i>eighty cubic centimeters</i>	80 Cc.
Antimony and Potassium Tartrate, <i>two grammes</i>	2 Gm.
Precipitated Calcium Phosphate, <i>ten grammes</i>	10 Gm.
Sugar, <i>seven hundred and fifty grammes</i>	750 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Fluid Extracts, evaporate them, in a tared capsule, on a water-bath, to *one hundred* (100) *grammes*, and mix the residue with *three hundred and fifty* (350) *cubic centimeters* of Water. When the mixture is cold, incorporate with it, intimately, the Precipitated Calcium Phosphate, filter, pass enough Water through the filter to obtain *four hundred* (400) *cubic centimeters* of filtrate, and add to this the Antimony and Potassium Tartrate dissolved in *twenty-five* (25) *cubic centimeters* of hot Water. Dissolve the Sugar in this liquid by agitation, without heat, strain, and add enough Water, through the strainer, to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

Compound Syrup of Squill may also be prepared in the following manner :

Prepare a percolator or funnel in the manner described under Syrup (see *Syrupus*). Pour the filtrate obtained as directed in the preceding formula, and mixed with the solution of Antimony and Potassium Tartrate, upon the Sugar, return the first portions of the percolate, until it runs through clear, and, when all the liquid has passed, follow it by Water, until the product measures *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

SYRUPUS SENEGÆ.

SYRUP OF SENEGA.

Fluid Extract of Senega, <i>two hundred cubic centimeters</i> ...	200 Cc.
Ammonia Water, <i>five cubic centimeters</i>	5 Cc.
Sugar, <i>seven hundred grammes</i>	700 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Fluid Extract of Senega with *three hundred* (300) *cubic centimeters* of Water and with the Ammonia Water, and set the mixture aside for a few hours. Then filter, and pass enough Water through the filter to obtain *five hundred and fifty* (550) *cubic centimeters*. In the filtrate dissolve the Sugar by agitation, without heat, strain, and add enough Water, through the strainer, to make the product measure *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

Syrup of Senega may also be prepared in the following manner :

Prepare a percolator or funnel in the manner described under Syrup (see *Syrupus*). Pour the filtrate obtained as directed in the preceding formula upon the Sugar, return the first portions of the percolate, until it runs through clear, and, when all the liquid has passed, follow it by Water, until the product measures *one thousand* (1000) *cubic centimeters*. Mix thoroughly.

SYRUPUS SENNÆ.

SYRUP OF SENNA.

Senna (Alexandria), bruised, <i>two hundred and fifty grammes</i>	250 Gm.
Oil of Coriander, <i>five cubic centimeters</i>	5 Cc.
Alcohol, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
Sugar, <i>seven hundred grammes</i>	700 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

To the Senna add *seven hundred (700) cubic centimeters* of boiling Water, and digest, at a temperature not exceeding 60° C. (140° F.), during twenty-four hours. Then express the liquid, and pass enough Water through the residue to obtain *six hundred (600) cubic centimeters* of liquid. Strain this, and, when it is cold, mix it with the Alcohol in which the Oil of Coriander had previously been dissolved. Set it aside until the precipitate has subsided, then pour off the clear liquid, filter the remainder, and pass enough Water through the filter to obtain *five hundred and fifty (550) cubic centimeters*. In the filtrate dissolve the Sugar by agitation, without heat, strain, and add enough Water, through the strainer, to make the product measure *one thousand (1000) cubic centimeters*. Mix thoroughly.

SYRUPUS TOLUTANUS.

SYRUP OF TOLU.

Balsam of Tolu, <i>ten grammes</i>	10 Gm.
Precipitated Calcium Phosphate, <i>fifty grammes</i>	50 Gm.
Sugar, <i>eight hundred and fifty grammes</i>	850 Gm.
Alcohol, <i>fifty cubic centimeters</i>	50 Cc.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Dissolve the Balsam of Tolu in the Alcohol, in a small flask or bottle, with the aid of a gentle heat. Mix the Precipitated Calcium Phosphate with *one hundred and fifty (150) grammes* of the Sugar, in a mortar, thoroughly incorporate with it the solution of the Balsam, and set the mortar aside, in a moderately warm place, until the Alcohol has evaporated. Then triturate the residue well with *five hundred (500) cubic centimeters* of Water, gradually added, and filter the mixture through a wetted filter, returning the first portions of the filtrate until it runs through clear. To the filtrate, heated to a temperature of about 60° C. (140° F.), add the remainder of the Sugar, and dissolve it by agitation. Then allow the Syrup to cool, strain it, and pass enough Water through the filter and strainer to make the product measure *one thousand (1000) cubic centimeters*. Mix thoroughly.

Syrup of Tolu may also be made in the following manner :

Prepare a percolator or funnel in the manner described under Syrup (see *Syrupus*). Pour the filtrate obtained as directed in the preceding formula upon the Sugar, return the first portions of the percolate, until it runs through clear, and, when all the liquid has passed, follow it by Water, until the product measures *one thousand (1000) cubic centimeters*. Mix thoroughly.

SYRUPUS ZINGIBERIS.

SYRUP OF GINGER.

Fluid Extract of Ginger, <i>thirty cubic centimeters</i>	30 Cc.
Precipitated Calcium Phosphate, <i>fifteen grammes</i>	15 Gm.
Sugar, <i>eight hundred and fifty grammes</i>	850 Gm.
Water, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Triturate the Fluid Extract of Ginger with the Precipitated Calcium Phosphate, and expose the mixture in a warm place until the Alcohol has evaporated. Then triturate the residue with *four hundred and fifty (450) cubic centimeters* of Water, and filter. In the filtrate dissolve the Sugar by agitation, without heat, strain, and pass enough Water through the filter to make the product measure *one thousand (1000) cubic centimeters*. Mix thoroughly.

Syrup of Ginger may also be prepared in the following manner :

Prepare a percolator or funnel in the manner described under Syrup (see *Syrupus*). Pour the filtrate obtained as directed in the preceding formula upon the Sugar, return the first portions of the percolate, until it runs through clear, and, when all the liquid has passed, follow it by Water, until the product measures *one thousand (1000) cubic centimeters*. Mix thoroughly.

TABACUM.

TOBACCO.

The commercial, dried leaves of *Nicotiana Tabacum* Linné (nat. ord. *Solanaceæ*).

Up to 50 Cm. long, oval or ovate-lanceolate, acute, entire, brown, friable, glandular-hairy, of a heavy, peculiar odor, and a nauseous, bitter, and arid taste.

TAMARINDUS.

TAMARIND.

The preserved pulp of the fruit of *Tamarindus indica* Linné (nat. ord. *Leguminosæ*).

A reddish-brown, sweet, subacid, pulpy mass, containing strong, somewhat branching fibres, and polished, brown, flattish-quadrangular seeds, each enclosed in a tough membrane ; taste sweet and refreshingly acidulous.

A piece of bright iron, left for thirty minutes in contact with the pulp previously somewhat diluted with water, should not exhibit any reddish deposit of *copper*.

Preparation : Confectio Sennæ.

TANACETUM.**TANSY.**

The leaves and tops of *Tanacetum vulgare* Linné (nat. ord. *Compositæ*).

Leaves about 15 Cm. long; bipinnatifid, the segments oblong, obtuse, serrate or incised, smooth, dark green, and glandular; flower-heads corymbose, with an imbricated involucre, a convex, naked receptacle, and numerous yellow, tubular florets; odor strongly aromatic; taste pungent and bitter.

TARAXACUM.**TARAXACUM.**

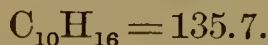
[DANDELION.]

The root of *Taraxacum officinale* Weber (nat. ord. *Compositæ*), gathered in autumn.

Slightly conical, about 30 Cm. long, and 1 or 2 Cm. thick above, crowned with several short, thickish heads, somewhat branched, dark brown, longitudinally wrinkled, when dry breaking with a short fracture, showing a yellowish, porous central axis, surrounded by a thick, white bark, containing numerous milk-vessels arranged in concentric circles; inodorous; bitter.

It should be free from the root of *Cichorium Intybus* Linné (nat. ord. *Compositæ*), which closely resembles it, but is usually paler, and has the milk-vessels in radiating lines.

Preparations: Extractum Taraxaci. Extractum Taraxaci Fluidum.

TEREBENUM.**TEREBENE.**

A liquid consisting chiefly of Pinene, and containing not more than very small proportions of Terpinene and Dipentene.

Terebene should be kept in well-stoppered bottles, in a cool place, protected from light.

A colorless or slightly yellowish, thin liquid, having a rather agreeable, thyme-like odor, and an aromatic, somewhat terebinthinate taste.

Specific gravity: about 0.862 at 15° C. (59° F.).

Only slightly soluble in water, but soluble in an equal volume of alcohol, glacial acetic acid, or carbon disulphide.

It boils at 156° to 160° C. (312.8° to 320° F.).

On exposure to light and air, Terebene gradually becomes resinified, and acquires an acid reaction.

In its chemical properties it resembles oil of turpentine. Terebene should possess its characteristic agreeable odor, should not redden moistened blue litmus paper (absence of acids), and should not have more than a very slight action on polarized light (limit of *unaltered oil of turpentine*).

When evaporated, it should not leave more than a very slight residue (absence of more than traces of *resinous matters*).

TEREBINTHINA.

TURPENTINE.

A concrete oleoresin obtained from *Pinus palustris* Miller, and from other species of *Pinus* (nat. ord. *Coniferæ*).

In yellowish, opaque, tough masses, brittle in the cold, crumbly-crystalline in the interior, of a terebinthinate odor and taste.

The alcoholic solution has an acid reaction.

TEREBINTHINA CANADENSIS.

CANADA TURPENTINE.

[CANADA BALSAM. BALSAM OF FIR.]

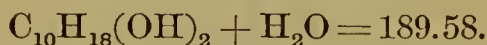
A liquid oleoresin obtained from *Abies balsamea* (Linné) Miller (nat. ord. *Coniferæ*).

A yellowish or faintly greenish, transparent, viscid liquid, of an agreeable, terebinthinate odor, and a bitterish, slightly acid taste.

When exposed to the air, it gradually dries, forming a transparent mass. It is completely soluble in ether, chloroform, or benzol.

TERPINI HYDRAS.

TERPIN HYDRATE.



The hydrate of the diatomic alcohol Terpin.

Terpin hydrate should be kept in well-stoppered bottles.

Colorless, lustrous, rhombic prisms, nearly odorless, and having a slightly aromatic and somewhat bitter taste. Permanent in the air.

Soluble, at 15° C. (59° F.), in about 250 parts of water, and in 10 parts of alcohol; in 32 parts of boiling water, and in 2 parts of boiling alcohol; also soluble in about 100 parts of ether, 200 parts of chloroform, or 1 part of boiling glacial acetic acid.

Terpin Hydrate melts at 116° to 117° C. (240.8° to 242.6° F.), with the loss of water, and, at the temperature of boiling water, sublimes in fine needles.

When heated in a flask adapted for distillation, it first loses water. At 258° C. (496.4° F.) anhydrous terpin distils over without decomposition, soon solidifying to a crystalline, hygroscopic mass, which melts at 102° to 105° C. (215.6° to 221° F.). When strongly heated on platinum foil, it burns with a bright, smoky flame, leaving no residue.

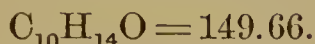
Terpin Hydrate is dissolved by sulphuric acid with an orange-yellow color.

If to its hot, aqueous solution a few drops of sulphuric acid be added, the liquid will become turbid and develop a strongly aromatic odor.

Terpin Hydrate should not have the odor of turpentine, and its hot, aqueous solution should not redden blue litmus paper (absence of *adhering acid*).

THYMOL.

THYMOL.



A phenol occurring in the volatile oils of *Thymus vulgaris* Linné, *Monarda punctata* Linné (nat. ord. *Labiatae*), and *Carum Ajowan* (Roxburgh) Benthams et Hooker (nat. ord. *Umbelliferae*).

It should be kept in well-stoppered bottles.

Large, colorless, translucent crystals of the hexagonal system, having an aromatic, thyme-like odor, and a pungent, aromatic taste, with a very slight caustic effect upon the lips.

Its specific gravity, as a solid, is 1.069 at 15° C. (59° F.), but when liquefied by fusion it is lighter than water. It melts at 50° to 51° C. (122° to 123.8° F.), remaining liquid at considerably lower temperatures. When triturated with about equal quantities of camphor, menthol, or chloral, it liquefies.

Soluble in about 1200 parts of water at 15° C. (59° F.), and in less than its own weight of alcohol, ether, or chloroform; also readily soluble in carbon disulphide, glacial acetic acid, and in fixed or volatile oils.

Its alcoholic solution is optically inactive.

If a very small crystal of Thymol be dissolved in 1 Cc. of glacial acetic acid, and then 6 drops of sulphuric acid and 1 drop of nitric acid be added, the liquid will assume a deep bluish-green color.

If 1 Gm. of Thymol be heated in a test-tube, in a water-bath, with 5 Cc. of a 10-per-cent. solution of sodium hydrate, a clear, colorless, or very slightly reddish solution should be formed, which becomes darker on standing, but without the separation of oily drops (absence of *thymen*, or *lævogyrate pinene*, $\text{C}_{10}\text{H}_{16}$). If to this solution a few drops of chloroform be added, and the mixture agitated, a violet color will be produced.

When a crystal of Thymol is heated in an open capsule, or in a watch-glass, on a water-bath, it should gradually volatilize, leaving no residue (absence of *paraffin*, *spermaceti*, etc.).

TINCTURA ACONITI.

TINCTURE OF ACONITE.

Aconite, in No. 60 powder, *three hundred and fifty grammes* 350 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix Alcohol and Water in the proportion of *seven hundred (700) cubic centimeters* of Alcohol to *three hundred (300) cubic centimeters* of Water. Having moistened the powder with *two hundred (200) cubic centimeters* of menstruum, macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour menstruum upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA ALOES.**TINCTURE OF ALOES.**

Purified Aloes, in moderately fine powder, <i>one hundred grammes</i>	100 Gm.
Liquorice Root, in No. 40 powder, <i>two hundred grammes</i>	200 Gm.
Diluted Alcohol, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix the powders, and, having moistened the mixture with *eighty* (80) *cubic centimeters* of Diluted Alcohol, macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA ALOES ET MYRRHÆ.**TINCTURE OF ALOES AND MYRRH.**

Purified Aloes, <i>one hundred grammes</i>	100 Gm.
Myrrh, <i>one hundred grammes</i>	100 Gm.
Liquorice Root, in No. 40 powder, <i>one hundred grammes</i>	100 Gm.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix Alcohol and Water in the proportion of *seven hundred and fifty* (750) *cubic centimeters* of Alcohol to *two hundred and fifty* (250) *cubic centimeters* of Water. Having mixed the Aloes, Myrrh, and Liquorice Root, reduce them to a moderately coarse (No. 40) powder. Moisten the powder with *sixty* (60) *cubic centimeters* of the menstruum, and macerate for twenty-four hours; then pack it moderately in a cylindrical percolator, and gradually pour menstruum upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA ARNICÆ FLORUM.**TINCTURE OF ARNICA FLOWERS.**

Arnica Flowers, in No. 20 powder, <i>two hundred grammes</i>	200 Gm.
Diluted Alcohol, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Pack the powder firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA ARNICÆ RADICIS.**TINCTURE OF ARNICA ROOT.**

Arnica Root, in No. 40 powder, *one hundred grammes* . . . 100 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix Alcohol and Water in the proportion of *six hundred and fifty (650) cubic centimeters* of Alcohol to *three hundred and fifty (350) cubic centimeters* of Water. Moisten the powder with *one hundred and fifty (150) cubic centimeters* of the menstruum, and macerate for twenty-four hours; then pack it moderately in a cylindrical percolator, and gradually pour menstruum upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA ASAFŒTIDÆ.**TINCTURE OF ASAFETIDA.**

Asafetida, bruised, *two hundred grammes*. 200 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix the Asafetida with *eight hundred (800) cubic centimeters* of Alcohol, and macerate for seven days, in a closed vessel; then filter through paper, adding, through the filter, enough Alcohol to make the Tincture measure *one thousand (1000) cubic centimeters*.

TINCTURA AURANTII AMARI.**TINCTURE OF BITTER ORANGE PEEL.**

Bitter Orange Peel, in No. 30 powder, *two hundred grammes*. 200 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix Alcohol and Water in the proportion of *six hundred (600) cubic centimeters* of Alcohol to *four hundred (400) cubic centimeters* of Water. Moisten the powder with *two hundred (200) cubic centimeters* of the menstruum, and macerate for twenty-four hours; then pack it moderately in a cylindrical percolator, and gradually pour menstruum upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA AURANTII DULCIS.

TINCTURE OF SWEET ORANGE PEEL.

Sweet Orange Peel, taken from the fresh fruit, *two hundred grammes* 200 Gm.
 Alcohol, a sufficient quantity,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix the Orange Peel (which should be as free as possible from the inner, white layer), previously cut into small pieces, with *eight hundred* (800) *cubic centimeters* of Alcohol, and macerate for twenty-four hours; then pack it moderately in a conical percolator, and gradually pour Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA BELLADONNÆ FOLIORUM.

TINCTURE OF BELLADONNA LEAVES.

[TINCTURA BELLADONNÆ, PHARM. 1880.]

Belladonna Leaves, in No. 60 powder, *one hundred and fifty grammes* 150 Gm.
 Diluted Alcohol, a sufficient quantity,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *two hundred* (200) *cubic centimeters* of Diluted Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA BENZOINI.

TINCTURE OF BENZOIN.

Benzoin, in moderately coarse powder, *two hundred grammes* 200 Gm.
 Alcohol, a sufficient quantity,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix the powder with *eight hundred* (800) *cubic centimeters* of Alcohol, and macerate for seven days, in a closed vessel; then filter through paper, adding, through the filter, enough Alcohol to make the Tincture measure *one thousand* (1000) *cubic centimeters*.

TINCTURA BENZOINI COMPOSITA.

COMPOUND TINCTURE OF BENZOIN.

Benzoin, in coarse powder, <i>one hundred and twenty grammes</i>	120 Gm.
Purified Aloes, in coarse powder, <i>twenty grammes</i>	20 Gm.
Storax, <i>eighty grammes</i>	80 Gm.
Balsam of Tolu, <i>forty grammes</i>	40 Gm.
Alcohol, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix the Benzoin, Aloes, Storax, and Balsam of Tolu with *eight hundred (800) cubic centimeters* of Alcohol, and digest the mixture, at a temperature not exceeding 65° C. (149° F.), for two hours in a closed vessel; then filter through paper, adding, through the filter, enough Alcohol to make the Tincture, when cold, measure *one thousand (1000) cubic centimeters*.

TINCTURA BRYONIAÆ.

TINCTURE OF BRYONIA.

Bryonia, recently dried, and in No. 40 powder, <i>one hundred grammes</i>	100 Gm.
Alcohol, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the powder with *one hundred (100) cubic centimeters* of Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Alcohol upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA CALENDULÆ.

TINCTURE OF CALENDULA.

Calendula, in No. 20 powder, <i>two hundred grammes</i>	200 Gm.
Alcohol, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the powder with *two hundred (200) cubic centimeters* of Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Alcohol upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA CALUMBÆ.

TINCTURE OF CALUMBA.

Calumba, in No. 20 powder, *one hundred grammes* 100 Gm.
Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix Alcohol and Water in the proportion of *six hundred (600) cubic centimeters* of Alcohol to *four hundred (400) cubic centimeters* of Water. Having moistened the powder with *one hundred (100) cubic centimeters* of the menstruum, macerate for twenty-four hours; then pack it in a cylindrical percolator, and gradually pour menstruum upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA CANNABIS INDICÆ.

TINCTURE OF INDIAN CANNABIS.

Indian Cannabis, in No. 40 powder, *one hundred and fifty grammes*. 150 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *one hundred and fifty (150) cubic centimeters* of Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Alcohol upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA CANTHARIDIS.

TINCTURE OF CANTHARIDES.

Cantharides, in No. 60 powder, *fifty grammes*. 50 Gm.
Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *thirty (30) cubic centimeters* of Alcohol, and pack it firmly in a cylindrical percolator; then gradually pour Alcohol upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA CAPSICI.**TINCTURE OF CAPSICUM.**

Capsicum, in No. 30 powder, *fifty grammes* 50 Gm.
 Alcohol,
 Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix Alcohol and Water in the proportion of *nine hundred and fifty (950) cubic centimeters* of Alcohol to *fifty (50) cubic centimeters* of Water. Having moistened the powder with *forty (40) cubic centimeters* of the menstruum, pack it firmly in a cylindrical percolator; then gradually pour menstruum upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA CARDAMOMI.**TINCTURE OF CARDAMOM.**

Cardamom, in No. 30 powder, *one hundred grammes* 100 Gm.
 Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Moisten the powder with *one hundred (100) cubic centimeters* of Diluted Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA CARDAMOMI COMPOSITA.**COMPOUND TINCTURE OF CARDAMOM.**

Cardamom, *twenty grammes* 20 Gm.
 Cassia Cinnamon, *twenty grammes*..... 20 Gm.
 Caraway, *ten grammes* 10 Gm.
 Cochineal, *five grammes*..... 5 Gm.
 Glycerin, *fifty cubic centimeters* 50 Cc.
 Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Cardamom, Cinnamon, Caraway, and Cochineal, and reduce them to a moderately coarse (No. 40) powder. Having moistened the powder with *twenty-five (25) cubic centimeters* of Diluted Alcohol, pack it firmly in a cylindrical percolator, and gradually pour Diluted

Alcohol upon it, until *nine hundred and fifty (950) cubic centimeters* of Tincture are obtained ; then add the Glycerin, and mix them.

TINCTURA CATECHU COMPOSITA.

COMPOUND TINCTURE OF CATECHU.

Catechu, in No. 40 powder, <i>one hundred grammes</i>	100 Gm..
Cassia Cinnamon, in No. 40 powder, <i>fifty grammes</i>	50 Gm.
Diluted Alcohol, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix the powders, and, without moistening, pack the mixture firmly in a cylindrical percolator ; then gradually pour Diluted Alcohol upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA CHIRATÆ.

TINCTURE OF CHIRATA.

Chirata, in No. 40 powder, <i>one hundred grammes</i>	100 Gm.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix Alcohol and Water in the proportion of *six hundred and fifty (650) cubic centimeters* of Alcohol to *three hundred and fifty (350) cubic centimeters* of Water. Having moistened the powder with *one hundred (100) cubic centimeters* of the menstruum, macerate for twenty-four hours ; then pack it firmly in a cylindrical percolator, and gradually pour menstruum upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA CIMICIFUGÆ.

TINCTURE OF CIMICIFUGA.

Cimicifuga, in No. 60 powder, <i>two hundred grammes</i>	200 Gm.
Alcohol, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Moisten the powder with *one hundred and fifty (150) cubic centimeters* of Alcohol, and macerate for twenty-four hours ; then pack it firmly in a cylindrical percolator, and gradually pour Alcohol upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA CINCHONÆ.

TINCTURE OF CINCHONA.

Cinchona, in No. 60 powder, <i>two hundred grammes</i>	200 Gm.
Glycerin, <i>seventy-five cubic centimeters</i>	75 Cc.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Glycerin with *six hundred and seventy-five (675) cubic centimeters* of Alcohol and *two hundred and fifty (250) cubic centimeters* of Water. Having moistened the powder with *two hundred (200) cubic centimeters* of the menstruum, macerate for twenty-four hours; then pack it firmly in a cylindrical glass percolator, and pour on the remainder of the menstruum. When the liquid has disappeared from the surface, gradually pour on more of a mixture of Alcohol and Water, made in the same proportions as before, and continue the percolation, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA CINCHONÆ COMPOSITA.

COMPOUND TINCTURE OF CINCHONA.

Red Cinchona, <i>one hundred grammes</i>	100 Gm.
Bitter Orange Peel, <i>eighty grammes</i>	80 Gm.
Serpentaria, <i>twenty grammes</i>	20 Gm.
Glycerin, <i>seventy-five cubic centimeters</i>	75 Cc.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Glycerin with *eight hundred and fifty (850) cubic centimeters* of Alcohol and *seventy-five (75) cubic centimeters* of Water. Having mixed the Cinchona, Orange Peel, and Serpentaria, reduce them to a fine (No. 60) powder. Moisten the powder with *two hundred (200) cubic centimeters* of the menstruum, and macerate for twenty-four hours; then pack it firmly in a cylindrical glass percolator, and gradually pour on the remainder of the menstruum. When the liquid has disappeared from the surface, gradually pour on more of a mixture of Alcohol and Water, made in the same proportions as before, and continue the percolation, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA CINNAMOMI.

TINCTURE OF CINNAMON.

Ceylon Cinnamon, in No. 40 powder, *one hundred grammes* 100 Gm.
 Glycerin, *fifty cubic centimeters* 50 Cc.
 Alcohol,
 Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Glycerin with *seven hundred and fifty (750) cubic centimeters* of Alcohol and *two hundred (200) cubic centimeters* of Water. Having moistened the powder with *fifty (50) cubic centimeters* of the menstruum, pack it in a conical percolator, gradually pour on the remainder of the menstruum, and afterwards more of a mixture of Alcohol and Water, made in the same proportions as before, and continue the percolation, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA COLCHICI SEMINIS.

TINCTURE OF COLCHICUM SEED.

[TINCTURA COLCHICI, PHARM. 1880.]

Colchicum Seed, in No. 30 powder, *one hundred and fifty grammes*..... 150 Gm.
 Alcohol,
 Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix Alcohol and Water in the proportion of *six hundred (600) cubic centimeters* of Alcohol and *four hundred (400) cubic centimeters* of Water. Having moistened the powder with *one hundred (100) cubic centimeters* of the menstruum, macerate for twenty-four hours; then pack it moderately in a cylindrical percolator, and gradually pour menstruum upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA CROCI.

TINCTURE OF SAFFRON.

Saffron, *one hundred grammes* 100 Gm.
 Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Moisten the Saffron with *one hundred (100) cubic centimeters* of Diluted Alcohol, and macerate for twenty-four hours; then pack it

firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA CUBEBAE.

TINCTURE OF CUBEBA.

Cubeb, in No. 30 powder, *two hundred grammes* 200 Gm.
Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the powder with *one hundred* (100) *cubic centimeters* of Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA DIGITALIS.

TINCTURE OF DIGITALIS.

Digitalis, in No. 60 powder, *one hundred and fifty grammes* 150 Gm.
Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the powder with *one hundred and fifty* (150) *cubic centimeters* of Diluted Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURÆ HERBARUM RECENTIUM.

TINCTURES OF FRESH HERBS.

These Tinctures, when not otherwise directed, are to be prepared by the following formula :

Take of

The Fresh Herb, bruised or crushed, *five hundred grammes* 500 Gm.
Alcohol, *one thousand cubic centimeters* 1000 Cc.

Macerate the Herb with the Alcohol for fourteen days; then express the liquid and filter.

TINCTURA FERRI CHLORIDI.

TINCTURE OF FERRIC CHLORIDE.

A hydro-alcoholic solution of Ferric Chloride [$\text{Fe}_2\text{Cl}_6 = 323.98$] containing about 13.6 per cent. of the anhydrous salt, and corresponding to about 4.7 (4.69) per cent. of metallic iron.

Solution of Ferric Chloride, two hundred and fifty cubic

centimeters 250 Cc.

Alcohol, a sufficient quantity,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix the Solution with enough Alcohol to make *one thousand* (1000) *cubic centimeters*. Let the Tincture stand, in a closely-covered vessel, at least three months; then transfer it to glass-stoppered bottles, and keep it protected from light.

A bright, brownish liquid, having a slightly ethereal odor, a very astringent, styptic taste, and an acid reaction.

Specific gravity: about 0.960 at 15° C. (59° F.).

The Tincture yields a brownish-red precipitate with ammonia water, a blue one with potassium ferrocyanide T.S., and a white one, insoluble in nitric acid, with silver nitrate T.S.

After the Tincture has been exposed for some time to daylight, it yields a greenish or greenish-blue color with potassium ferricyanide T.S., showing the presence of some ferrous salt, due to reduction.

If the iron be completely precipitated from a portion of the Tincture by an excess of ammonia water, the filtrate should be colorless, and should not yield a white or dark-colored precipitate with hydrogen sulphide T.S. (absence of *zinc* or *copper*), nor should it leave a fixed residue on evaporation and gentle ignition (absence of *salts of the fixed alkalies*).

On adding a clear crystal of ferrous sulphate to a cooled mixture of equal volumes of concentrated sulphuric acid and a moderately dilute portion of the Tincture, the crystal should not become colored brown, nor should there be a brownish-black zone developed around it (absence of *nitric acid*).

On diluting 1 Cc. of the Tincture with water to 12 Cc., and boiling, the liquid should remain clear (absence of *orychloride*).

If 1.12 (1.1176) Gm. of the Tincture be introduced into a glass-stoppered bottle (having a capacity of about 100 Cc.), together with 15 Cc. of water and 2 Cc. of hydrochloric acid, and, after the addition of 1 Gm. of potassium iodide, the mixture be kept for half an hour at a temperature of 40° C. (104° F.), then cooled, and mixed with a few drops of starch T.S., it should require about 9.4 Cc. of decinormal sodium hyposulphite V.S. to discharge the blue or greenish color of the liquid (each Cc. of the volumetric solution indicating 0.5 per cent. of metallic iron).

Preparation: Liquor Ferri et Ammonii Acetatis.

TINCTURA GALLÆ.

TINCTURE OF NUTGALL.

Nutgall, in No. 40 powder, two hundred grammes 200 Gm.

Glycerin, one hundred cubic centimeters 100 Cc.

Alcohol, a sufficient quantity,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix the Glycerin with *nine hundred (900) cubic centimeters* of Alcohol. Pack the powder, without moistening it, in a conical glass percolator; then gradually pour upon it the menstruum, and, afterwards, Alcohol, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA GELSEMII.

TINCTURE OF GELSEMIUM.

Gelsemium, in No. 60 powder, <i>one hundred and fifty</i>	
<i>grammes</i>	150 Gm.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix Alcohol and Water in the proportion of *six hundred and fifty (650) cubic centimeters* of Alcohol to *three hundred and fifty (350) cubic centimeters* of Water. Having moistened the powder with *one hundred (100) cubic centimeters* of the menstruum, macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour menstruum upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA GENTIANÆ COMPOSITA.

COMPOUND TINCTURE OF GENTIAN.

Gentian, <i>one hundred grammes</i>	100 Gm.
Bitter Orange Peel, <i>forty grammes</i>	40 Gm.
Cardamom, <i>ten grammes</i>	10 Gm.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Gentian, Orange Peel, and Cardamom, and reduce the mixture to a moderately coarse (No. 40) powder. Mix Alcohol and Water in the proportion of *six hundred (600) cubic centimeters* of Alcohol to *four hundred (400) cubic centimeters* of Water. Having moistened the powder with *one hundred (100) cubic centimeters* of menstruum, macerate for twenty-four hours; then pack it in a cylindrical percolator, and gradually pour menstruum upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA GUAIACI.**TINCTURE OF GUAIAAC.**

Guaiac, in coarse powder, *two hundred grammes* 200 Gm.
 Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the powder with *eight hundred* (800) *cubic centimeters* of Alcohol, and macerate for seven days, in a closed vessel; then filter through paper, adding, through the filter, enough Alcohol to make the Tincture measure *one thousand* (1000) *cubic centimeters*.

TINCTURA GUAIACI AMMONIATA.**AMMONIATED TINCTURE OF GUAIAAC.**

Guaiac, in coarse powder, *two hundred grammes* 200 Gm.
 Aromatic Spirit of Ammonia, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the powder with *eight hundred* (800) *cubic centimeters* of Aromatic Spirit of Ammonia, and macerate for seven days, in a closed vessel; then filter through paper, in a well-covered funnel, and add, through the filter, Aromatic Spirit of Ammonia, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA HUMULI.**TINCTURE OF HOPS.**

Hops, well dried and in No. 20 powder, *two hundred grammes* 200 Gm.
 Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Moisten the powder with *four hundred* (400) *cubic centimeters* of Diluted Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA HYDRASTIS.**TINCTURE OF HYDRASTIS.**

Hydrastis, in No. 60 powder, *two hundred grammes* 200 Gm.
 Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Moisten the powder with *one hundred and fifty* (150) *cubic centimeters* of Diluted Alcohol, and macerate for twenty-four hours ; then pack it firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA HYOSCYAMI.

TINCTURE OF HYOSCYAMUS.

Hyoscyamus, in No. 60 powder, *one hundred and fifty grammes*..... 150 Gm.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Moisten the powder with *one hundred and fifty* (150) *cubic centimeters* of Diluted Alcohol, and macerate for twenty-four hours ; then pack it firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA IODI.

TINCTURE OF IODINE.

Iodine, *seventy grammes* 70 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Triturate the Iodine rapidly, in a mortar, to a coarse powder, and transfer it at once to a graduated bottle. Rinse the mortar with several successive portions of Alcohol, and pour the rinsings into the bottle. Then add Alcohol, shaking the bottle occasionally, until the Iodine is dissolved, and the finished Tincture measures *one thousand* (1000) *cubic centimeters*.

If 6.3 Cc. of the Tincture be mixed with a solution of 2 Gm. of potassium iodide in 25 Cc. of water, and a little starch T.S. added, it should require, for complete decoloration, about 35 Cc. of decinormal sodium hyposulphite V.S. (corresponding to about 7 Gm. of iodine in 100 Cc.).

TINCTURA IPECACUANHÆ ET OPII.

TINCTURE OF IPECAC AND OPIUM.

Tincture of Deodorized Opium, *one thousand cubic centimeters*..... 1000 Cc.

Fluid Extract of Ipecac, *one hundred cubic centimeters* 100 Cc.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Evaporate the Tincture of Deodorized Opium, in a tared capsule, on a water-bath, until it weighs *eight hundred* (800) *grammes*. When

it has become cold, add to it the Fluid Extract of Ipecac, filter the mixture, and pass enough Diluted Alcohol through the filter to make the Tincture measure *one thousand* (1000) *cubic centimeters*.

TINCTURA KINO.

TINCTURE OF KINO.

Kino, <i>one hundred grammes</i>	100 Gm.
Glycerin, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
Water, <i>two hundred cubic centimeters</i>	200 Cc.
Alcohol, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Glycerin with the Water and *six hundred and fifty* (650) *cubic centimeters* of Alcohol. Rub the Kino, in a mortar, adding gradually a sufficient quantity of the menstruum, until a smooth paste is produced. Transfer this to a bottle, add the remainder of the menstruum, and macerate for twenty-four hours, with occasional agitation. Then filter through paper, adding, through the filter, enough Alcohol to make the product measure *one thousand* (1000) *cubic centimeters*. Keep the Tincture in small, completely-filled and well-stoppered bottles, in a cool place.

TINCTURA KRAMERIÆ.

TINCTURE OF KRAMERIA.

Krameria, in No. 40 powder, <i>two hundred grammes</i>	200 Gm.
Diluted Alcohol, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Moisten the powder with *two hundred* (200) *cubic centimeters* of Diluted Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA LACTUCARII.

TINCTURE OF LACTUCARIUM.

Lactucarium, <i>five hundred grammes</i>	500 Gm.
Glycerin, <i>two hundred and fifty cubic centimeters</i>	250 Cc.
Water,	
Alcohol,	
Benzin,	
Diluted Alcohol, each, <i>a sufficient quantity</i> .	

Beat the Lactucarium in an iron mortar, with clean sand, to a coarse powder, and introduce it into a bottle; add *two thousand* (2000) *cubic centimeters* of Benzin, cork the bottle tightly, and set it aside for forty-eight hours, frequently agitating the mixture. Pour the mixture on a double filter, and allow it to drain. Wash the residue by gradually adding *fifteen hundred* (1500) *cubic centimeters* of Benzin. Allow the Lactucarium to dry by exposing it to a current of air. When it is dry, and free from the odor of Benzin, reduce it to powder, using more sand, if necessary, and pack it moderately in a conical percolator. Mix the Glycerin with *two hundred* (200) *cubic centimeters* of Water, and *five hundred* (500) *cubic centimeters* of Alcohol, and moisten the powder with *five hundred* (500) *cubic centimeters* of the mixture. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for twenty-four hours. Then allow the percolation to proceed very slowly, gradually adding, first, the remainder of the menstruum, and then Diluted Alcohol, until the Lactucarium is exhausted. Reserve the first *seven hundred and fifty* (750) *cubic centimeters* of the percolate, evaporate the remainder on a water-bath, at a temperature not exceeding 70° C. (158° F.), to *two hundred and fifty* (250) *cubic centimeters*, and mix this with the reserved portion. Filter, and add enough Diluted Alcohol through the filter to make the product measure *one thousand* (1000) *cubic centimeters*.

Preparation: Syrupus Lactucarii.

TINCTURA LAVANDULÆ COMPOSITA.

COMPOUND TINCTURE OF LAVENDER.

[COMPOUND SPIRIT OF LAVENDER.]

Oil of Lavender Flowers, <i>eight cubic centimeters</i>	8 Cc.
Oil of Rosemary, <i>two cubic centimeters</i>	2 Cc.
Cassia Cinnamon, in coarse powder, <i>twenty grammes</i>	20 Gm.
Cloves, <i>five grammes</i>	5 Gm.
Nutmeg, <i>ten grammes</i>	10 Gm.
Red Saunders, in coarse powder, <i>ten grammes</i>	10 Gm.
Alcohol, <i>seven hundred cubic centimeters</i>	700 Cc.
Water, <i>two hundred and fifty cubic centimeters</i>	250 Cc.
Diluted Alcohol, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. 1000 Cc.

Dissolve the Oils in the Alcohol, and add the Water. Crush the Nutmeg in a mortar, mix it with the Cinnamon, Cloves, and Red Saunders, and reduce the mixture, by grinding, to a coarse (No. 20)

powder. Moisten the mixture with a sufficient quantity of the alcoholic solution of the Oils, pack it firmly in a cylindrical percolator, gradually pour upon it the remainder of the alcoholic solution, and, afterwards, Diluted Alcohol, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA LOBELIÆ.

TINCTURE OF LOBELIA.

Lobelia, in No. 40 powder, *two hundred grammes* 200 Gm.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the powder with *two hundred* (200) *cubic centimeters* of Diluted Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA MATICO.

TINCTURE OF MATICO.

Matico, in No. 40 powder, *one hundred grammes* 100 Gm.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the Matico with *one hundred* (100) *cubic centimeters* of Diluted Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA MOSCHI.

TINCTURE OF MUSK.

Musk, *fifty grammes* 50 Gm.

Alcohol, *four hundred and fifty cubic centimeters* 450 Cc.

Water, *four hundred and fifty cubic centimeters* 450 Cc.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Rub the Musk in a mortar, first, with a little of the Water, until a smooth mixture is made, and then with the remainder of the Water. Transfer the whole to a bottle, add the Alcohol, and macerate the mixture for seven days, occasionally shaking the bottle. Then filter

through paper, adding, through the filter, enough Diluted Alcohol to make the Tincture measure *one thousand* (1000) *cubic centimeters*.

TINCTURA MYRRHÆ.

TINCTURE OF MYRRH.

Myrrh, in moderately coarse powder, *two hundred grammes* 200 Gm.
Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix the powder with *eight hundred* (800) *cubic centimeters* of Alcohol, and macerate for seven days in a closed vessel; then filter through paper, adding, through the filter, enough Alcohol to make the Tincture measure *one thousand* (1000) *cubic centimeters*.

TINCTURA NUCIS VOMICÆ.

TINCTURE OF NUX VOMICA.

Extract of Nux Vomica, dried at 100° C. (212° F.),
twenty grammes. 20 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Dissolve the Extract of Nux Vomica (which should contain *fifteen* (15) *per cent.* of alkaloids) in a sufficient quantity of a mixture of *three* (3) *volumes* of Alcohol and *one* (1) *volume* of Water, to make the Tincture measure *one thousand* (1000) *cubic centimeters*.

If 100 Cc. of Tincture of Nux Vomica be evaporated to dryness, and the residue tested by the process of assay given under *Extractum Nucis Vomicæ*, it should be found to contain 0.3 Gm. of alkaloids.

TINCTURA OPII.

TINCTURE OF OPIUM.

[LAUDANUM.]

Powdered Opium, *one hundred grammes* 100 Gm.

Precipitated Calcium Phosphate, *fifty grammes* 50 Gm.

Water, *four hundred cubic centimeters* 400 Cc.

Alcohol, *four hundred cubic centimeters*. 400 Cc.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Rub the powders in a mortar, with the Water previously heated to the temperature of 90° C. (194° F.), until a smooth mixture is made, and macerate for twelve hours; then add the Alcohol, mix thoroughly, and transfer the whole to a cylindrical percolator. Return to the percolator the first portion of the percolate, until it runs through clear, and, when the liquid ceases to drop, gradually pour on Diluted Alcohol, continuing the percolation slowly, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

If 100 Cc. of Tincture of Opium be assayed by the process immediately following, it should yield from 1.3 to 1.5 Gm. of crystallized morphine.

Assay of Tincture of Opium.

Tincture of Opium, <i>one hundred cubic centimeters</i>	100 Cc.
Ammonia Water, <i>three and five-tenths cubic centimeters</i>	3.5 Cc.
Alcohol,	
Ether,	
Water, each, <i>a sufficient quantity</i> .	

Evaporate the Tincture to about 20 Cc., add 40 Cc. of water, mix thoroughly, and set the liquid aside for an hour, occasionally stirring, and disintegrating the resinous flakes adhering to the capsule. Then filter, and wash the filter and residue with water, until all soluble matters are extracted, collecting the washings separately. Evaporate in a tared capsule, first, the washings to a small volume, then add the first filtrate, and evaporate the whole to a weight of 14 Gm. Rotate the concentrated solution about in the capsule until the rings of extract are redissolved, pour the liquid into a tared Erlenmeyer flask having a capacity of about 100 Cc., and rinse the capsule with a few drops of water at a time, until the entire solution weighs 20 Gm. Then add 10 Gm. (or 12.2 Cc.) of alcohol, shake well, add 25 Cc. of ether, and shake again. Now add the ammonia water from a graduated pipette or burette, stopper the flask with a sound cork, shake it thoroughly during ten minutes, and then set it aside, in a moderately cool place, for at least six hours, or over night.

Remove the stopper carefully, and, should any crystals adhere to it, brush them into the flask. Place in a small funnel two rapidly-acting filters, of a diameter of 7 Cm., plainly folded, one within the other (the triple fold of the inner filter being laid against the single side of the outer filter), wet them well with ether, and decant the ethereal solution as completely as possible upon the inner filter. Add 10 Cc. of ether to the contents of the flask, rotate it, and again decant the ethereal layer upon the inner filter. Repeat this operation with another portion of 10 Cc. of ether. Then pour into the filter the liquid in the flask, in portions, in such a way as to transfer the greater portion of the crystals to the filter, and, when this has passed through, transfer the remaining crystals to the filter by washing the flask with several portions of water, using not more than about 10 Cc. in all. Allow the double filter to drain, then apply water to the crystals, drop by drop, until they are practically free from mother-water, and afterwards wash them, drop by drop, from a pipette, with alcohol previously saturated with powdered morphine. When this has passed through, displace the remaining alcohol by ether, using about 10 Cc., or more if necessary. Allow the filter to dry in a moderately warm place, at a temperature not exceeding 60° C. (140° F.), until its weight remains constant, then carefully transfer the crystals to a tared watch-glass and weigh them.

The weight found represents the amount of crystallized morphine obtained from 100 Cc. of the Tincture.

TINCTURA OPII CAMPHORATA.

CAMPHORATED TINCTURE OF OPIUM.

[PAREGORIC.]

Powdered Opium, <i>four grammes</i>	4 Gm.
Benzoic Acid, <i>four grammes</i>	4 Gm.
Camphor, <i>four grammes</i>	4 Gm.
Oil of Anise, <i>four cubic centimeters</i>	4 Cc.
Glycerin, <i>forty cubic centimeters</i>	40 Cc.
Diluted Alcohol, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Add *nine hundred (900) cubic centimeters* of Diluted Alcohol to the other ingredients, contained in a suitable vessel, and macerate for three days, shaking frequently; then filter through paper, in a well-covered funnel, and pass enough Diluted Alcohol through the filter to make the product measure *one thousand (1000) cubic centimeters*.

TINCTURA OPII DEODORATI.

TINCTURE OF DEODORIZED OPIUM.

[TINCTURA OPII DEODORATA, PHARM. 1880.]

Powdered Opium, <i>one hundred grammes</i>	100 Gm.
Precipitated Calcium Phosphate, <i>fifty grammes</i>	50 Gm.
Ether, <i>two hundred cubic centimeters</i>	200 Cc.
Alcohol, <i>two hundred cubic centimeters</i>	200 Cc.
Water, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Rub the powders in a mortar with *four hundred (400) cubic centimeters* of Water previously heated to the temperature of 90° C. (194° F.), until a smooth mixture is made, and macerate for twelve hours; then pour the mixture on a filter, or transfer it to a cylindrical percolator, and gradually pour on Water, until the Opium is practically exhausted. Reduce the percolate, by evaporation on a water-bath, to *one hundred (100) cubic centimeters*, and, when it has cooled, shake it repeatedly with the Ether in a bottle. When the ethereal solution has separated by standing, pour it off, and evaporate the remaining liquid until all traces of Ether have disappeared. Mix the residue with *five hundred (500) cubic centimeters* of Water, and filter the mixture through paper. When the liquid has ceased to pass, add enough Water, through the

filter, to make the filtered liquid measure *eight hundred* (800) *cubic centimeters*. Lastly, add the Alcohol, and mix them.

If 100 Cc. of Tincture of Deodorized Opium be assayed by the process given under *Tinctura Opii*, it should yield from 1.3 to 1.5 Gm. of crystallized morphine.

Preparation: *Tinctura Ipecacuanhæ et Opii*.

TINCTURA PHYSOSTIGMATIS.

TINCTURE OF PHYSOSTIGMA.

Physostigma, in No. 40 powder, *one hundred and fifty grammes*..... 150 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Moisten the powder with *one hundred* (100) *cubic centimeters* of Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA PYRETHRI.

TINCTURE OF PYRETHRUM.

Pyrethrum, in No. 40 powder, *two hundred grammes*.... 200 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Moisten the powder with *one hundred and fifty* (150) *cubic centimeters* of Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA QUASSIÆ.

TINCTURE OF QUASSIA.

Quassia, in No. 40 powder, *one hundred grammes*..... 100 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix Alcohol and Water in the proportion of *three hundred and fifty* (350) *cubic centimeters* of Alcohol to *six hundred and fifty* (650) *cubic centimeters* of Water. Having moistened the powder with *one hundred* (100) *cubic centimeters* of the menstruum, macerate for twenty-four

hours; then pack it firmly in a cylindrical percolator, and gradually pour menstruum upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA QUILLAJÆ.

TINCTURE OF QUILLAJA.

Quillaja, coarsely ground, <i>two hundred grammes</i>	200 Gm.
Alcohol, <i>three hundred and fifty cubic centimeters</i>	350 Cc.
Water, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Boil the Quillaja, placed in a suitable vessel, with *eight hundred* (800) *cubic centimeters* of Water for fifteen minutes, strain, and wash the residue on the strainer with *one hundred* (100) *cubic centimeters* of Water. Then boil the strained liquid down to *six hundred* (600) *cubic centimeters*, allow it to cool, mix it with the Alcohol, and, when the insoluble matter has subsided, filter the liquid portion through paper, and add enough Water to make the Tincture measure *one thousand* (1000) *cubic centimeters*.

TINCTURA RHEI.

TINCTURE OF RHUBARB.

Rhubarb, <i>one hundred grammes</i>	100 Gm.
Cardamom, <i>twenty grammes</i>	20 Gm.
Glycerin, <i>one hundred cubic centimeters</i>	100 Cc.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Mix the Rhubarb and Cardamom, and reduce the mixture to a moderately coarse (No. 40) powder. Mix the Glycerin with *six hundred* (600) *cubic centimeters* of Alcohol and *three hundred* (300) *cubic centimeters* of Water. Moisten the powder with *one hundred* (100) *cubic centimeters* of the menstruum, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour on the remainder of the menstruum. When the liquid has disappeared from the surface, gradually pour on more of a mixture of Alcohol and Water, made in the same proportions as before, and continue the percolation, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA RHEI AROMATICA.

AROMATIC TINCTURE OF RHUBARB.

Rhubarb, <i>two hundred grammes</i>	200 Gm.
Cassia Cinnamon, <i>forty grammes</i>	40 Gm.
Cloves, <i>forty grammes</i>	40 Gm.
Nutmeg, <i>twenty grammes</i>	20 Gm.
Glycerin, <i>one hundred cubic centimeters</i>	100 Cc.
Alcohol,	
Water,	
Diluted Alcohol, each, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Rhubarb, Cinnamon, Cloves, and Nutmeg, and reduce the mixture to a moderately coarse (No. 40) powder. Mix the Glycerin with *five hundred (500) cubic centimeters* of Alcohol and *four hundred (400) cubic centimeters* of Water. Moisten the powder with *one hundred and fifty (150) cubic centimeters* of the menstruum, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour on the remainder of the menstruum. When the liquid has disappeared from the surface, gradually pour Diluted Alcohol upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

Preparation: Syrupus Rhei Aromaticus.

TINCTURA RHEI DULCIS.

SWEET TINCTURE OF RHUBARB.

Rhubarb, <i>one hundred grammes</i>	100 Gm.
Glycyrrhiza, <i>forty grammes</i>	40 Gm.
Anise, <i>forty grammes</i>	40 Gm.
Cardamom, <i>ten grammes</i>	10 Gm.
Glycerin, <i>one hundred cubic centimeters</i>	100 Cc.
Alcohol,	
Water,	
Diluted Alcohol, each, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Rhubarb, Glycyrrhiza, Anise, and Cardamom, and reduce the mixture to a moderately coarse (No. 40) powder. Mix the Glycerin with *five hundred (500) cubic centimeters* of Alcohol and *four hundred (400) cubic centimeters* of Water. Moisten the powder with *one hundred*

and fifty (150) *cubic centimeters* of the menstruum, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour on the remainder of the menstruum. When the liquid has disappeared from the surface, gradually pour Diluted Alcohol upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA SANGUINARIÆ.

TINCTURE OF SANGUINARIA.

Sanguinaria, in No. 60 powder, <i>one hundred and fifty grammes</i>	150 Gm.
Acetic Acid, <i>twenty cubic centimeters</i>	20 Cc.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix Alcohol and Water in the proportion of *six hundred* (600) *cubic centimeters* of Alcohol to *four hundred* (400) *cubic centimeters* of Water. Moisten the powder with *one hundred* (100) *cubic centimeters* of the mixture to which the Acetic Acid had previously been added, and macerate for twenty-four hours; then pack it firmly in a cylindrical glass percolator, gradually pour on more of a mixture of Alcohol and Water, made in the same proportions as before, and continue the percolation, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA SCILLÆ.

TINCTURE OF SQUILL.

Squill, in No. 30 powder, <i>one hundred and fifty grammes</i> ..	150 Gm.
Alcohol,	
Water, each, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix Alcohol and Water in the proportion of *seven hundred and fifty* (750) *cubic centimeters* of Alcohol to *two hundred and fifty* (250) *cubic centimeters* of Water. Moisten the powder with *two hundred* (200) *cubic centimeters* of the menstruum, and macerate for twenty-four hours; then pack it moderately in a conical percolator, and gradually pour menstruum upon it, until *one thousand* (1000) *cubic centimeters* of Tincture are obtained.

TINCTURA SERPENTARIÆ.

TINCTURE OF SERPENTARIA.

Serpentaria, in No. 40 powder, *one hundred grammes*. . . . 100 Gm.
Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix Alcohol and Water in the proportion of *six hundred and fifty (650) cubic centimeters* of Alcohol to *three hundred and fifty (350) cubic centimeters* of Water. Moisten the powder with *one hundred (100) cubic centimeters* of the menstruum, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour menstruum upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA STRAMONII SEMINIS.

TINCTURE OF STRAMONIUM SEED.

[TINCTURA STRAMONII, PHARM. 1880.]

Stramonium Seed, in No. 40 powder, *one hundred and fifty grammes*. 150 Gm.

Diluted Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Moisten the powder with *one hundred (100) cubic centimeters* of Diluted Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Diluted Alcohol upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA STROPHANTHI.

TINCTURE OF STROPHANTHUS.

Strophanthus, in No. 30 powder, *fifty grammes* 50 Gm.
Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix Alcohol and Water in the proportion of *six hundred and fifty (650) cubic centimeters* of Alcohol to *three hundred and fifty (350) cubic centimeters* of Water. Digest the powder with *seventy (70) cubic centimeters* of the menstruum for two days, then transfer it to a cylindrical percolator, gradually pour menstruum upon it, and continue the percolation very slowly, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA SUMBUL.

TINCTURE OF SUMBUL.

Sumbul, in No. 30 powder, *one hundred grammes* 100 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix Alcohol and Water in the proportion of *six hundred and fifty (650) cubic centimeters* of Alcohol to *three hundred and fifty (350) cubic centimeters* of Water. Moisten the powder with *one hundred (100) cubic centimeters* of the menstruum, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour menstruum upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA TOLUTANA.

TINCTURE OF TOLU.

Balsam of Tolu, *one hundred grammes*. 100 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Add the Balsam of Tolu to *nine hundred (900) cubic centimeters* of Alcohol, and macerate until it is dissolved; then filter through paper, adding, through the filter, enough Alcohol to make the Tincture measure *one thousand (1000) cubic centimeters*.

TINCTURA VALERIANÆ.

TINCTURE OF VALERIAN.

Valerian, in No. 60 powder, *two hundred grammes* 200 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters*. . . . 1000 Cc.

Mix Alcohol and Water in the proportion of *seven hundred and fifty (750) cubic centimeters* of Alcohol to *two hundred and fifty (250) cubic centimeters* of Water. Moisten the powder with *one hundred (100) cubic centimeters* of the menstruum, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour menstruum upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA VALERIANÆ AMMONIATA.

AMMONIATED TINCTURE OF VALERIAN.

Valerian, in No. 60 powder, *two hundred grammes* 200 Gm.
Aromatic Spirit of Ammonia, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Moisten the powder with *two hundred (200) cubic centimeters* of Aromatic Spirit of Ammonia, and macerate for twenty-four hours, in a closed vessel; then pack it firmly in a cylindrical glass percolator, and gradually pour Aromatic Spirit of Ammonia upon it, keeping the percolator well covered, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA VANILLÆ.

TINCTURE OF VANILLA.

Vanilla, cut into small pieces and bruised, *one hundred grammes* 100 Gm.

Sugar, in coarse powder, *two hundred grammes* 200 Gm.

Alcohol,

Water, each, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Mix Alcohol and Water in the proportion of *six hundred and fifty (650) cubic centimeters* of Alcohol to *three hundred and fifty (350) cubic centimeters* of Water. Macerate the Vanilla in *five hundred (500) cubic centimeters* of this mixture for twelve hours, then drain off the liquid, and set it aside. Transfer the Vanilla to a mortar, beat it with the Sugar into a uniform powder, then pack it in a percolator, and pour upon it the reserved liquid. When this has disappeared from the surface, gradually pour on menstruum, and continue the percolation, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA VERATRI VIRIDIS.

TINCTURE OF VERATRUM VIRIDE.

Veratrum Viride, in No. 60 powder, *four hundred grammes* 400 Gm.

Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* 1000 Cc.

Moisten the powder with *one hundred and fifty (150) cubic centimeters* of Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Alcohol upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

TINCTURA ZINGIBERIS.

TINCTURE OF GINGER.

Ginger, in No. 40 powder, *two hundred grammes* 200 Gm.
 Alcohol, *a sufficient quantity*,

To make *one thousand cubic centimeters* . . . 1000 Cc.

Moisten the Ginger with *fifty (50) cubic centimeters* of Alcohol, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour Alcohol upon it, until *one thousand (1000) cubic centimeters* of Tincture are obtained.

Preparation: Trochisci Zingiberis.

TRAGACANTHA.

TRAGACANTH.

A gummy exudation from *Astragalus gummifer* Labillardière, and from other species of *Astragalus* (nat. ord. *Leguminosæ*).

In narrow or broad bands, more or less curved or contorted, marked by parallel lines or ridges, white or faintly yellowish, translucent, horn-like, tough, and rendered more easily pulverizable by a heat of 50° C. (122° F.).

On treating Tragacanth with water, it swells and gradually forms a gelatinous mass, which is tinged blue by iodine T.S., and the fluid portion of which is precipitated on the addition of alcohol, but is not colored blue by iodine T.S.

Preparation: Mucilago Tragacanthæ.

TRITICUM.

TRITICUM.

[COUCH-GRASS.]

The rhizome of *Agropyrum repens* (Linné) Beauvois (nat. ord. *Gramineæ*), gathered in the spring and deprived of the roots.

Very long and creeping, about 2 Mm. thick; as met with in the shops, cut into sections about 1 Cm. long; smooth, but wrinkled; hollow in the centre, straw-yellow; inodorous; taste sweetish.

Preparation: Extractum Tritici Fluidum.

TRITURATIONES.

TRITURATIONS.

Unless otherwise directed, Triturations are to be prepared by the following formula:

Take of

The Substance, *ten grammes* 10 Gm.
 Sugar of Milk, in moderately fine powder, *ninety grammes* 90 Gm.

To make *one hundred grammes* . . . 100 Gm.

Weigh the Substance and the Sugar of Milk, separately ; then place the Substance, previously reduced, if necessary, to a moderately fine powder, in a mortar ; add about an equal measure of Sugar of Milk, mix well by means of a spatula, and triturate them thoroughly together. Then add fresh portions of the Sugar of Milk, from time to time, until the whole is added, and continue the trituration until the Substance is intimately mixed with the Sugar of Milk and reduced to a fine powder.

TRITURATIO ELATERINI.

TRITURATION OF ELATERIN.

Elaterin, <i>ten grammes</i>	10 Gm.
Sugar of Milk, in moderately fine powder, <i>ninety grammes</i>	90 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Mix them thoroughly by trituration.

TROCHISCI ACIDI TANNICI.

TROCHES OF TANNIC ACID.

Tannic Acid, <i>six grammes</i>	6 Gm.
Sugar, in fine powder, <i>sixty-five grammes</i>	65 Gm.
Tragacanth, in fine powder, <i>two grammes</i>	2 Gm.
Stronger Orange Flower Water, <i>a sufficient quantity</i> ,	
To make <i>one hundred troches</i>	100

Rub the powders together until they are thoroughly mixed ; then, with Stronger Orange Flower Water, form a mass, to be divided into *one hundred (100) troches*.

TROCHISCI AMMONII CHLORIDI.

TROCHES OF AMMONIUM CHLORIDE.

Ammonium Chloride, in fine powder, <i>ten grammes</i>	10 Gm.
Extract of Glycyrrhiza, in fine powder, <i>twenty-five grammes</i>	25 Gm.
Tragacanth, in fine powder, <i>two grammes</i>	2 Gm.
Sugar, in fine powder, <i>fifty grammes</i>	50 Gm.
Syrup of Tolu, <i>a sufficient quantity</i> ,	
To make <i>one hundred troches</i>	100

Rub the powders together until they are thoroughly mixed ; then, with Syrup of Tolu, form a mass, to be divided into *one hundred (100) troches*.

TROCHISCI CATECHU.

TROCHES OF CATECHU.

Catechu, in fine powder, <i>six grammes</i>	6 Gm.
Sugar, in fine powder, <i>sixty-five grammes</i>	65 Gm.
Tragacanth, in fine powder, <i>two grammes</i>	2 Gm.
Stronger Orange Flower Water, <i>a sufficient quantity</i> ,	
To make <i>one hundred troches</i>	100

Rub the powders together until they are thoroughly mixed; then, with Stronger Orange Flower Water, form a mass, to be divided into *one hundred (100) troches*.

TROCHISCI CRETÆ.

TROCHES OF CHALK.

Prepared Chalk, <i>twenty-five grammes</i>	25 Gm.
Acacia, in fine powder, <i>seven grammes</i>	7 Gm.
Spirit of Nutmeg, <i>three cubic centimeters</i>	3 Cc.
Sugar, in fine powder, <i>forty grammes</i>	40 Gm.
Water, <i>a sufficient quantity</i> ,	
To make <i>one hundred troches</i>	100

Rub the powders with the Spirit of Nutmeg until they are thoroughly mixed; then, with Water, form a mass, to be divided into *one hundred (100) troches*.

TROCHISCI CUBEBÆ.

TROCHES OF CUBEBA.

Oleoresin of Cubeba, <i>four grammes</i>	4 Gm.
Oil of Sassafras, <i>one cubic centimeter</i>	1 Cc.
Extract of Glycyrrhiza, in fine powder, <i>twenty-five grammes</i>	25 Gm.
Acacia, in fine powder, <i>twelve grammes</i>	12 Gm.
Syrup of Tolu, <i>a sufficient quantity</i> ,	
To make <i>one hundred troches</i>	100

Rub the powders together until they are thoroughly mixed; then add the Oleoresin and the Oil, and incorporate them with the mixture. Lastly, with Syrup of Tolu, form a mass, to be divided into *one hundred (100) troches*.

TROCHISCI FERRI.

TROCHES OF IRON.

Ferric Hydrate, dried at a temperature not exceeding 80° C. (176° F.), <i>thirty grammes</i>	30 Gm.
Vanilla, cut into slices, <i>one gramme</i>	1 Gm.
Sugar, in fine powder, <i>one hundred grammes</i>	100 Gm.
Mucilage of Tragacanth, <i>a sufficient quantity</i> ,	
To make <i>one hundred troches</i>	100

Rub the Vanilla, first, with a portion of the Sugar to a uniform powder, and afterwards with the Ferric Hydrate and the remainder of the Sugar, until they are thoroughly mixed. Then, with Mucilage of Tragacanth, form a mass, to be divided into *one hundred (100) troches*.

TROCHISCI GLYCYRRHIZÆ ET OPII.

TROCHES OF GLYCYRRHIZA AND OPIUM.

Extract of Glycyrrhiza, in fine powder, <i>fifteen grammes</i> 15	Gm.
Powdered Opium, <i>one-half gramme</i>	0.5 Gm.
Acacia, in fine powder, <i>twelve grammes</i>	12 Gm.
Sugar, in fine powder, <i>twenty grammes</i>	20 Gm.
Oil of Anise, <i>two-tenths of a cubic centimeter</i>	0.2 Cc.
Water, <i>a sufficient quantity</i> ,	
To make <i>one hundred troches</i> ...	100

Rub the powders together until they are thoroughly mixed; then add the Oil of Anise (equivalent to about 4 drops), and incorporate it with the mixture. Lastly, with Water, form a mass, to be divided into *one hundred (100) troches*.

TROCHISCI IPECACUANHÆ.

TROCHES OF IPECAC.

Ipecac, in No. 60 powder, <i>two grammes</i>	2 Gm.
Tragacanth, in fine powder, <i>two grammes</i>	2 Gm.
Sugar, in fine powder, <i>sixty-five grammes</i>	65 Gm.
Syrup of Orange, <i>a sufficient quantity</i> ,	
To make <i>one hundred troches</i>	100

Rub the powders together until they are thoroughly mixed; then, with Syrup of Orange, form a mass, to be divided into *one hundred (100) troches*.

TROCHISCI KRAMERIÆ.

TROCHES OF KRAMERIA.

Extract of Krameria, <i>six grammes</i>	6 Gm.
Sugar, in fine powder, <i>sixty-five grammes</i>	65 Gm.
Tragacanth, in fine powder, <i>two grammes</i>	2 Gm.
Stronger Orange Flower Water, <i>a sufficient quantity</i> ,	
To make <i>one hundred troches</i>	100

Rub the powders together until they are thoroughly mixed; then, with Stronger Orange Flower Water, form a mass, to be divided into *one hundred (100) troches*.

TROCHISCI MENTHÆ PIPERITÆ.

TROCHES OF PEPPERMINT.

Oil of Peppermint, <i>one cubic centimeter</i>	1 Cc.
Sugar, in fine powder, <i>eighty grammes</i>	80 Gm.
Mucilage of Tragacanth, <i>a sufficient quantity</i> ,	
To make <i>one hundred troches</i>	100

Rub the Oil of Peppermint and the Sugar together until they are thoroughly mixed; then, with Mucilage of Tragacanth, form a mass, to be divided into *one hundred (100) troches*.

TROCHISCI MORPHINÆ ET IPECACUANHÆ.

TROCHES OF MORPHINE AND IPECAC.

Morphine Sulphate, <i>sixteen centigrammes</i>	0.16 Gm.
Ipecac, in No. 60 powder, <i>fifty centigrammes</i>	0.50 Gm.
Sugar, in fine powder, <i>sixty-five grammes</i>	65.00 Gm.
Oil of Gaultheria, <i>two-tenths of a cubic centimeter</i>	0.2 Cc.
Mucilage of Tragacanth, <i>a sufficient quantity</i> ,	
To make <i>one hundred troches</i>	100

Rub the powders together until they are thoroughly mixed; then add the Oil of Gaultheria (equivalent to about 4 drops), and incorporate it with the mixture. Lastly, with Mucilage of Tragacanth, form a mass, to be divided into *one hundred (100) troches*.

TROCHISCI POTASSII CHLORATIS.

TROCHES OF POTASSIUM CHLORATE.

Potassium Chlorate, in fine powder, <i>thirty grammes</i>	30 Gm.
Sugar, in fine powder, <i>one hundred and twenty grammes</i> . . .	120 Gm.
Tragacanth, in fine powder, <i>six grammes</i>	6 Gm.
Spirit of Lemon, <i>one cubic centimeter</i>	1 Cc.
Water, <i>a sufficient quantity</i> ,	

To make *one hundred troches*. . . . 100

Mix the Sugar with the Tragacanth and the Spirit of Lemon by trituration, in a mortar; then transfer the mixture to a sheet of paper, and, by means of a bone spatula, mix with it the Potassium Chlorate, being careful, by avoiding trituration or pressure, to prevent the mixture from igniting or exploding. Lastly, with Water, form a mass, to be divided into *one hundred (100) troches*.

TROCHISCI SANTONINI.

TROCHES OF SANTONIN.

Santonin, in fine powder, <i>three grammes</i>	3 Gm.
Sugar, in fine powder, <i>one hundred and ten grammes</i>	110 Gm.
Tragacanth, in fine powder, <i>three grammes</i>	3 Gm.
Stronger Orange Flower Water, <i>a sufficient quantity</i> ,	

To make *one hundred troches*. . . . 100

Rub the powders together until they are thoroughly mixed; then, with Stronger Orange Flower Water, form a mass, to be divided into *one hundred (100) troches*.

Troches of Santonin should be kept in dark, amber-colored vials.

TROCHISCI SODII BICARBONATIS.

TROCHES OF SODIUM BICARBONATE.

Sodium Bicarbonate, <i>twenty grammes</i>	20 Gm.
Sugar, in fine powder, <i>sixty grammes</i>	60 Gm.
Nutmeg, bruised, <i>one gramme</i>	1 Gm.
Mucilage of Tragacanth, <i>a sufficient quantity</i> ,	

To make *one hundred troches*. . . . 100

Triturate the Nutmeg with the Sugar, gradually added, until they are reduced to a fine powder, and mix this intimately with the Sodium Bicarbonate; then, with Mucilage of Tragacanth, form a mass, to be divided into *one hundred (100) troches*.

TROCHISCI ZINGIBERIS.

TROCHES OF GINGER.

Tincture of Ginger, <i>twenty cubic centimeters</i>	20 Cc.
Tragacanth, in fine powder, <i>four grammes</i>	4 Gm.
Sugar, in fine powder, <i>one hundred and thirty grammes</i>	130 Gm.
Syrup of Ginger, <i>a sufficient quantity</i> ,	

To make *one hundred troches*.... 100

Mix the Tincture of Ginger with the Sugar, and, having exposed the mixture to the air until dry, reduce it to a fine powder. To this add the Tragacanth, and mix thoroughly. Lastly, with Syrup of Ginger, form a mass, to be divided into *one hundred (100) troches*.

ULMUS.

ELM.

[SLIPPERY ELM.]

The inner bark of *Ulmus fulva* Michaux (nat. ord. *Urticaceæ*).

In flat pieces, varying in length and width, about 3 Mm. thick, tough, pale brownish-white, the inner surface finely ridged; fracture fibrous and mealy; the transverse section delicately checkered; odor slight, peculiar; taste mucilaginous, insipid.

Preparation: Mucilago Ulmi.

UNGUENTUM.

OINTMENT.

Lard, <i>eight hundred grammes</i>	800 Gm.
Yellow Wax, <i>two hundred grammes</i>	200 Gm.

To make *one thousand grammes*.... 1000 Gm.

Melt the Yellow Wax, and gradually add to it the Lard; then stir the mixture constantly until it is cool.

UNGUENTUM ACIDI CARBOLICI.

OINTMENT OF CARBOLIC ACID.

Carbolic Acid, <i>five grammes</i>	5 Gm.
Ointment, <i>ninety-five grammes</i>	95 Gm.

To make *one hundred grammes*.... 100 Gm.

Mix them thoroughly.

UNGUENTUM ACIDI TANNICI.

OINTMENT OF TANNIC ACID.

Tannic Acid, in fine powder, <i>twenty grammes</i>	20 Gm.
Benzoinated Lard, <i>eighty grammes</i>	80 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Rub the Tannic Acid with the Benzoinated Lard, gradually added, until they are thoroughly mixed, avoiding the use of iron utensils.

UNGUENTUM AQUÆ ROSÆ.

OINTMENT OF ROSE WATER.

[COLD CREAM.]

Spermaceti, <i>one hundred and twenty-five grammes</i>	125 Gm.
White Wax, <i>one hundred and twenty grammes</i>	120 Gm.
Expressed Oil of Almond, <i>six hundred cubic centimeters</i>	600 Cc.
Stronger Rose Water, <i>one hundred and ninety cubic centimeters</i>	190 Cc.
Sodium Borate, in fine powder, <i>five grammes</i>	5 Gm.

Reduce the Spermaceti and the White Wax to fine shavings, and melt them at a moderate heat. Then add the expressed Oil of Almond, pour the mixture into a warmed, shallow Wedgwood mortar, carefully add, without stirring, the whole of the Stronger Rose Water in which the Sodium Borate had previously been dissolved, and stir rapidly and continuously, until the mixture becomes uniformly soft and creamy.

UNGUENTUM BELLADONNÆ.

BELLADONNA OINTMENT.

Alcoholic Extract of Belladonna Leaves, <i>ten grammes</i>	10 Gm.
Diluted Alcohol, <i>five grammes</i>	5 Gm.
Benzoinated Lard, <i>eighty-five grammes</i>	85 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Rub the Extract with the Diluted Alcohol until it is uniformly soft, then gradually add the Lard, and mix thoroughly.

UNGUENTUM CHRYSAROBINI.**CHRYSAROBIN OINTMENT.**

Chrysarobin, <i>five grammes</i>	5 Gm.
Benzoinated Lard, <i>ninety-five grammes</i>	95 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Rub the Chrysarobin with the Benzoinated Lard, gradually added, until they are thoroughly mixed.

UNGUENTUM DIACHYLON.**DIACHYLON OINTMENT.**

Lead Plaster, <i>five hundred grammes</i>	500 Gm.
Olive Oil, <i>four hundred and ninety grammes</i>	490 Gm.
Oil of Lavender Flowers, <i>ten grammes</i>	10 Gm.
To make <i>one thousand grammes</i>	1000 Gm.

Melt together the Lead Plaster and the Olive Oil, on a water-bath; then, having allowed the mixture to become partly cool, add the Oil of Lavender Flowers, and stir constantly, until the Ointment is cold.

UNGUENTUM GALLÆ.**NUTGALL OINTMENT.**

Nutgall, in No. 80 powder, <i>twenty grammes</i>	20 Gm.
Benzoinated Lard, <i>eighty grammes</i>	80 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Rub the Nutgall with the Benzoinated Lard, gradually added, until they are thoroughly mixed.

UNGUENTUM HYDRARGYRI.**MERCURIAL OINTMENT.**

[BLUE OINTMENT.]

Mercury, <i>five hundred grammes</i>	500 Gm.
Lard, <i>two hundred and fifty grammes</i>	250 Gm.
Suet, <i>two hundred and thirty grammes</i>	230 Gm.
Oleate of Mercury, <i>twenty grammes</i>	20 Gm.
To make <i>one thousand grammes</i>	1000 Gm.

Triturate the Oleate of Mercury with the Mercury, gradually added, in a mortar, until globules of the metal are no longer visible. Then

add the Lard and Suet, previously melted together and partially cooled, and continue the trituration until globules of Mercury are no longer visible under a lens magnifying ten diameters.

UNGUENTUM HYDRARGYRI AMMONIATI.

OINTMENT OF AMMONIATED MERCURY.

Ammoniated Mercury, in very fine powder, <i>ten grammes</i>	10 Gm.
Benzoinated Lard, <i>ninety grammes</i>	90 Gm.
To make <i>one hundred-grammes</i>	100 Gm.

Rub the Ammoniated Mercury with the Benzoinated Lard, gradually added, until they are thoroughly mixed.

UNGUENTUM HYDRARGYRI NITRATIS.

OINTMENT OF MERCURIC NITRATE.

[CITRINE OINTMENT.]

Mercury, <i>seventy grammes</i>	70 Gm.
Nitric Acid, <i>one hundred and seventy-five grammes</i>	175 Gm.
Lard Oil, <i>seven hundred and sixty grammes</i>	760 Gm.

Heat the Lard Oil, in a glass or porcelain vessel, to a temperature of 100° C. (212° F.); then withdraw the heat, gradually add *seventy* (70) *grammes* of Nitric Acid, and, when the reaction moderates, re-apply the heat, until effervescence ceases. Then allow the mixture to cool to about 40° C. (104° F.). Having dissolved the Mercury in the remainder of the Nitric Acid with the aid of sufficient heat to prevent the solution from crystallizing, add this solution to the mixture. When the mass has become entirely cold, mix it thoroughly by trituration, avoiding the use of a metallic spatula.

UNGUENTUM HYDRARGYRI OXIDI FLAVI.

OINTMENT OF YELLOW MERCURIC OXIDE.

Yellow Mercuric Oxide, in very fine powder, <i>ten grammes</i>	10 Gm.
Ointment, <i>ninety grammes</i>	90 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Rub the Yellow Mercuric Oxide with the Ointment, gradually added, until they are thoroughly mixed.

UNGUENTUM HYDRARGYRI OXIDI RUBRI.

OINTMENT OF RED MERCURIC OXIDE.

Red Mercuric Oxide, in very fine powder, <i>ten grammes</i>	10 Gm.
Castor Oil, <i>five grammes</i>	5 Gm.
Ointment, <i>eighty-five grammes</i>	85 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Triturate the Red Mercuric Oxide with the Castor Oil, until a perfectly smooth mixture results; then gradually incorporate the Ointment, and mix thoroughly.

UNGUENTUM IODI.

IODINE OINTMENT.

Iodine, <i>four grammes</i>	4 Gm.
Potassium Iodide, <i>one gramme</i>	1 Gm.
Water, <i>two cubic centimeters</i>	2 Cc.
Benzoinated Lard, <i>ninety-three grammes</i>	93 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Rub the Iodine and the Iodide of Potassium, first with the Water, and then with the Benzoinated Lard, gradually added, until they are thoroughly mixed, avoiding the use of a metallic spatula.

This preparation should be freshly made, when required.

UNGUENTUM IODOFORMI.

ODOFORM OINTMENT.

Iodoform, in very fine powder, <i>ten grammes</i>	10 Gm.
Benzoinated Lard, <i>ninety grammes</i>	90 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Rub the Iodoform with the Benzoinated Lard, gradually added, until they are thoroughly mixed.

This preparation should be freshly made, when required.

UNGUENTUM PICIS LIQUIDÆ.

TAR OINTMENT.

Tar, <i>five hundred grammes</i>	500 Gm.
Yellow Wax, <i>one hundred and twenty-five grammes</i>	125 Gm.
Lard, <i>three hundred and seventy-five grammes</i>	375 Gm.
To make <i>one thousand grammes</i>	1000 Gm.

Melt together the Yellow Wax and the Lard at a moderate heat. Then incorporate the Tar, strain the mixture through muslin, and stir the Ointment constantly until it is cool.

UNGUENTUM PLUMBI CARBONATIS.

OINTMENT OF LEAD CARBONATE.

Lead Carbonate, in very fine powder, <i>ten grammes</i>	10 Gm.
Benzoinated Lard, <i>ninety grammes</i>	90 Gm.

To make *one hundred grammes*.... 100 Gm.

Rub the Lead Carbonate with the Benzoinated Lard, gradually added, until they are thoroughly mixed.

UNGUENTUM PLUMBI IODIDI.

OINTMENT OF LEAD IODIDE.

Lead Iodide, in very fine powder, <i>ten grammes</i>	10 Gm.
Benzoinated Lard, <i>ninety grammes</i>	90 Gm.

To make *one hundred grammes*.... 100 Gm.

Rub the Lead Iodide with the Benzoinated Lard, gradually added, until they are thoroughly mixed.

UNGUENTUM POTASSII IODIDI.

OINTMENT OF POTASSIUM IODIDE.

Potassium Iodide, <i>twelve grammes</i>	12 Gm.
Sodium Hyposulphite, <i>one gramme</i>	1 Gm.
Water, hot, <i>ten cubic centimeters</i>	10 Cc.
Benzoinated Lard, <i>seventy-seven grammes</i>	77 Gm.

To make *one hundred grammes*.... 100 Gm.

Dissolve the Potassium Iodide and the Sodium Hyposulphite in the hot Water, then mix the solution with the Benzoinated Lard.

UNGUENTUM STRAMONII.

STRAMONIUM OINTMENT.

Extract of Stramonium Seed, <i>ten grammes</i>	10 Gm.
Diluted Alcohol, <i>five grammes</i>	5 Gm.
Benzoinated Lard, <i>eighty-five grammes</i>	85 Gm.

To make *one hundred grammes*.... 100 Gm.

Rub the Extract with the Diluted Alcohol until it is uniformly soft; then gradually add the Benzoinated Lard, and mix thoroughly.

UNGUENTUM SULPHURIS.

SULPHUR OINTMENT.

Washed Sulphur, <i>three hundred grammes</i>	300 Gm.
Benzoinated Lard, <i>seven hundred grammes</i>	700 Gm.
To make <i>one thousand grammes</i>	1000 Gm.

Rub the Washed Sulphur with the Benzoinated Lard, gradually added, until they are thoroughly mixed.

UNGUENTUM VERATRINÆ.

VERATRINE OINTMENT.

Veratrine, <i>four grammes</i>	4 Gm.
Olive Oil, <i>six grammes</i>	6 Gm.
Benzoinated Lard, <i>ninety grammes</i>	90 Gm.
To make <i>one hundred grammes</i>	100 Gm.

Rub the Veratrine with the Olive Oil, in a mortar; then gradually add the Benzoinated Lard, and mix thoroughly.

UNGUENTUM ZINCI OXIDI.

OINTMENT OF ZINC OXIDE.

Zinc Oxide, <i>two hundred grammes</i>	200 Gm.
Benzoinated Lard, <i>eight hundred grammes</i>	800 Gm.
To make <i>one thousand grammes</i>	1000 Gm.

Sift the Zinc Oxide, through a No. 20 sieve, upon the surface of the Benzoinated Lard, previously melted, and incorporate it by stirring, which is to be continued until the Ointment is cool.

UVA URSI.

UVA URSI.

[BEARBERRY.]

The leaves of *Arctostaphylos Uva-ursi* (Linné) Sprengel (nat. ord. *Ericaceæ*).

Very short-stalked, obovate or oblong-spatulate, coriaceous, from 15 to 20 Mm. long, and 5 to 8 Mm. broad, obtuse, slightly revolute on the margin, upper surface with depressed veins; lower surface distinctly reticulate; odor faint, hay-like; taste strongly astringent, and somewhat bitter.

Preparations: Extractum Uvæ Ursi. Extractum Uvæ Ursi Fluidum.

VALERIANA.

VALERIAN.

The rhizome and roots of *Valeriana officinalis* Linné (nat. ord. *Valerianæ*).

Rhizome from 2 to 4 Cm. long, and 1 to 2 Cm. thick, upright, subglobular or obconical, truncate at both ends, brown or yellowish-brown, internally whitish or pale brownish, with a narrow circle of white wood under the thin bark. Roots numerous, slender, brittle, brown, with a thick bark, and slender, ligneous cord. Odor peculiar, becoming stronger and unpleasant on keeping; taste camphoraceous and somewhat bitter.

Preparations: Extractum Valerianæ Fluidum. Tinctura Valerianæ. Tinctura Valerianæ Ammoniata.

VANILLA.

VANILLA.

The fruit of *Vanilla planifolia* Andrews (nat. ord. *Orchideæ*).

From 15 to 25 Cm. long, and about 8 Mm. thick, linear, narrowed and bent or hooked at the base, rather oblique at the apex, wrinkled, somewhat warty, dark brown, glossy-leathery, one-celled, and containing a blackish-brown pulp, with numerous, minute seeds, and more or less acicular crystals; odor and taste peculiar, fragrant.

Preparation: Tinctura Vanillæ.

VERATRINA.

VERATRINE.

A mixture of alkaloids obtained from the seed of *Asagracea officinalis* (Schlechtendal et Chamisso) Lindley (nat. ord. *Liliaceæ*).

A white or grayish-white, amorphous or semi-crystalline powder, odorless, but causing intense irritation and sneezing when even a minute quantity reaches the nasal mucous membrane; having an acrid taste, and leaving a sensation of tingling and numbness on the tongue; permanent in the air.

Very slightly soluble in cold or hot water; soluble in 3 parts of alcohol at 15° C. (59° F.), and very soluble in boiling alcohol; also soluble in 6 parts of ether, and in 2 parts of chloroform.

When heated to 175° C. (347° F.) Veratrine melts, forming a light brown liquid. Upon ignition, it is consumed, leaving no residue.

An alcoholic solution of Veratrine has an alkaline reaction upon litmus paper.

With nitric acid, Veratrine forms a yellow solution.

On triturating Veratrine with concentrated sulphuric acid, in a glass mortar, the yellow or orange-red solution exhibits, by reflected light, a greenish fluorescence, which becomes more intense upon the addition of more acid, while the liquid is deep red by transmitted light.

On heating a small portion of Veratrine with a few Cc. of hydrochloric acid, the liquid will acquire a deep red color.

Preparations: Oleatum Veratrinæ. Unguentum Veratrinæ.

VERATRUM VIRIDE.**VERATRUM VIRIDE.**

[AMERICAN HELLEBORE.]

The rhizome and roots of *Veratrum viride* Solander (nat. ord. *Liliaceæ*).

Rhizome upright, obconical, simple or divided, from 3 to 8 Cm. long, and 2 to 4 or 5 Cm. thick, externally blackish-gray, internally grayish-white, showing numerous short, irregular wood-bundles. Roots emanating from all sides of the rhizome, numerous, shrivelled, light yellowish-brown, about 10 to 20 Cm. long, and 2 Mm. thick. Inodorous, but strongly sternutatory when powdered ; taste bitterish and very acrid.

Preparations : Extractum Veratri Viridis Fluidum. Tinctura Veratri Viridis.

VIBURNUM OPULUS.**VIBURNUM OPULUS.**

[VIBURNUM, PHARM. 1880. CRAMP BARK.]

The bark of *Viburnum Opulus* Linné (nat. ord. *Caprifoliaceæ*).

In flattish or curved bands, or occasionally in quills, sometimes 30 Cm. long, and from 1 to 1.5 Mm. thick ; outer surface ash-gray, marked with scattered somewhat transversely elongated warts of a brownish color, due to abrasion, and more or less marked with blackish dots, and chiefly in a longitudinal direction with black, irregular lines or thin ridges ; underneath the easily-removed corky layer of a pale brownish or somewhat reddish-brown color ; the inner surface dingy white or brownish ; fracture tough, the tissue separating in layers ; inodorous ; taste somewhat astringent and bitter.

Preparation : Extractum Viburni Opuli Fluidum.

VIBURNUM PRUNIFOLIUM.**BLACK HAW.**

The bark of *Viburnum prunifolium* Linné (nat. ord. *Caprifoliaceæ*).

In thin pieces or quills, glossy purplish-brown, with scattered warts, and minute black dots ; when collected from old wood, grayish-brown ; the thin, corky layer easily removed from the green layer ; inner surface whitish, smooth ; fracture short ; inodorous, somewhat astringent and bitter.

Preparation : Extractum Viburni Prunifolii Fluidum.

VINUM ALBUM.**WHITE WINE.**

An alcoholic liquid, made by fermenting the juice of fresh grapes, the fruit of *Vitis vinifera* (nat. ord. *Vitaceæ*), freed from seeds, stems, and skins.

When White Wine is prescribed without further specification, it is recommended that a dry White Wine of domestic production (such as California Riesling, Ohio Catawba, etc.) be employed.

White Wine should be preserved in well-closed casks filled as full as possible, or in well-stoppered bottles, in a cool place.

A pale amber-colored or straw-colored liquid, having a pleasant odor free from yeastiness, and a fruity, agreeable, slightly spirituous taste without excessive sweetness or acidity.

The specific gravity, at 15.6° C. (60° F.), should not be less than 0.990, nor more than 1.010.

If a portion of White Wine be evaporated, the residue, when dried during twelve hours on a water-bath, should not amount to less than 1.5 nor more than 3 per cent.

To neutralize 50 Cc. of White Wine should require not less than 3 nor more than 5.2 Cc. of normal potassium hydrate V.S. (limit of *free acid*), phenolphthalein being used as indicator.

If 10 Cc. of White Wine be diluted with an equal volume of water, and treated with 5 drops of ferric chloride T.S., only a faint, greenish-brown color may make its appearance (absence of more than traces of *tannic acid*).

Tested by the following method, White Wine should be found to contain not less than 10 nor more than 14 per cent., by weight (equivalent to 12.4 to 17.3 per cent. by volume), of absolute alcohol:

Take the specific gravity (to four decimals) of a sufficient portion of the White Wine carefully measured at the temperature of 15.6° C. (60° F.), evaporate the Wine in a tared capsule to one-third of its original weight, cool, and add water until the liquid measures its original volume at 15.6° C. (60° F.); then take the specific gravity (to four decimals) again. The difference between the two specific gravities deducted from 1.0000 corresponds to the specific gravity of an alcohol containing the same percentage of absolute alcohol, by weight or volume, as the Wine under examination, the corresponding percentage being ascertained by referring to the alcoholometric tables.

VINUM ANTIMONII.

WINE OF ANTIMONY.

Antimony and Potassium Tartrate, <i>four grammes</i> . . .	4 Gm.
Boiling Distilled Water, <i>sixty-five cubic centimeters</i>	65 Cc.
Alcohol, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
White Wine, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix the Alcohol with *eight hundred* (800) *cubic centimeters* of White Wine. Dissolve the Antimony and Potassium Tartrate in the Boiling Distilled Water, and add the solution to the mixture. When the liquid is cold, filter it through paper, and add enough White Wine, through the filter, to make the product measure *one thousand* (1000) *cubic centimeters*.

VINUM COLCHICI RADICIS.

WINE OF COLCHICUM ROOT.

Colchicum Root, in No. 30 powder, <i>four hundred grammes</i>	400 Gm.
Alcohol, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
White Wine, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix the Alcohol with *eight hundred and fifty (850) cubic centimeters* of White Wine. Moisten the powder with *one hundred (100) cubic centimeters* of the menstruum, pack it moderately in a conical glass percolator, and gradually pour upon it, first, the remainder of the menstruum, and afterwards enough White Wine to make the product measure *one thousand (1000) cubic centimeters*.

VINUM COLCHICI SEMINIS.

WINE OF COLCHICUM SEED.

Colchicum Seed, in No. 30 powder, <i>one hundred and fifty grammes</i>	150 Gm.
Alcohol, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
White Wine, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix the Alcohol with *eight hundred and fifty (850) cubic centimeters* of White Wine. Macerate the powder with *nine hundred (900) cubic centimeters* of the mixture during seven days, in a closed vessel, with occasional agitation. Then filter through paper, adding, through the filter, first, the remainder of the menstruum, and afterwards enough White Wine to make the product measure *one thousand (1000) cubic centimeters*.

VINUM ERGOTÆ.

WINE OF ERGOT.

Ergot, recently ground, and in No. 30 powder, <i>one hundred and fifty grammes</i>	150 Gm.
Alcohol, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
White Wine, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters* . . . 1000 Cc.

Mix the Alcohol with *eight hundred and fifty (850) cubic centimeters* of White Wine. Moisten the powder with *forty (40) cubic centimeters* of the mixture, pack it moderately in a conical glass percolator, and gradually pour upon it, first, the remainder of the menstruum, and

afterwards enough White Wine to make the product measure *one thousand (1000) cubic centimeters*.

VINUM FERRI AMARUM.

BITTER WINE OF IRON.

Soluble Iron and Quinine Citrate, <i>fifty grammes</i>	50 Gm.
Tincture of Sweet Orange Peel, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
Syrup, <i>three hundred cubic centimeters</i>	300 Cc.
White Wine, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Dissolve the Soluble Iron and Quinine Citrate in *five hundred (500) cubic centimeters* of White Wine. Add to this the Tincture of Sweet Orange Peel and the Syrup, and, lastly, enough White Wine to make the product measure *one thousand (1000) cubic centimeters*. Set the mixture aside for several days, then filter, and pass enough White Wine through the filter to restore the original volume.

VINUM FERRI CITRATIS.

WINE OF FERRIC CITRATE.

Iron and Ammonium Citrate, <i>forty grammes</i>	40 Gm.
Tincture of Sweet Orange Peel, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
Syrup, <i>one hundred cubic centimeters</i>	100 Cc.
White Wine, <i>a sufficient quantity</i> ,	
To make <i>one thousand cubic centimeters</i>	1000 Cc.

Dissolve the Iron and Ammonium Citrate in *seven hundred (700) cubic centimeters* of White Wine. Add to this the Tincture of Sweet Orange Peel, and the Syrup, and, lastly, enough White Wine to make the product measure *one thousand (1000) cubic centimeters*. Set the mixture aside for several days, then filter, and pass enough White Wine through the filter to restore the original volume.

VINUM IPECACUANHÆ.

WINE OF IPECAC.

Fluid Extract of Ipecac, <i>one hundred cubic centimeters</i> . .	100 Cc.
Alcohol, <i>one hundred cubic centimeters</i>	100 Cc.
White Wine, <i>eight hundred cubic centimeters</i>	800 Cc.

To make *one thousand cubic centimeters* 1000 Cc.

Mix them. Set the mixture aside for a few days, then filter.

VINUM OPII.

WINE OF OPIUM.

Powdered Opium, <i>one hundred grammes</i>	100 Gm.
Cassia Cinnamon, in No. 60 powder, <i>ten grammes</i>	10 Gm.
Cloves, in No. 30 powder, <i>ten grammes</i>	10 Gm.
Alcohol, <i>one hundred and fifty cubic centimeters</i>	150 Cc.
White Wine, <i>a sufficient quantity</i> ,	

To make *one thousand cubic centimeters*.... 1000 Cc.

Mix the Alcohol with *eight hundred and fifty (850) cubic centimeters* of White Wine. To the mixed powders add *nine hundred (900) cubic centimeters* of the menstruum, and macerate during seven days, with occasional agitation. Then transfer the mixture to a filter, and, when the liquid has drained off, gradually pass through the filter, first, the remainder of the menstruum, and afterwards enough White Wine to make the product measure *one thousand (1000) cubic centimeters*.

If 100 Cc. of Wine of Opium be assayed by the process given under *Tinctura Opii*, it should yield from 1.3 to 1.5 Gm. of crystallized morphine.

VINUM RUBRUM.

RED WINE.

An alcoholic liquid, made by fermenting the juice of fresh colored grapes, the fruit of *Vitis vinifera* (nat. ord. *Vitaceæ*), in presence of their skins.

When Red Wine is prescribed without further specification, it is recommended that a dry Red Wine of domestic production (such as a native Claret, Burgundy, etc.) be employed.

Red Wine should be preserved in well-closed casks filled as full as possible, or in well-stoppered bottles, in a cool place.

A deep red liquid, having a pleasant odor free from yeastiness, and a fruity, moderately astringent, pleasant, and slightly acidulous taste, without excessive sweetness or acidity.

The specific gravity, at 15.6° C. (60° F.), should not be less than 0.989, nor more than 1.010.

If a portion of Red Wine be evaporated, the residue, when dried during twelve hours on a water-bath, should not amount to less than 1.6 per cent., nor more than 3.5 per cent.

To neutralize 50 Cc. of Red Wine should require not less than 3 nor more than 5.2 Cc. of normal potassium hydrate V.S. (limit of *free acid*), eosin or fluorescein being used as indicator.

If 10 Cc. of Red Wine be diluted with an equal volume of water, and treated with 5 drops of ferric chloride T.S., the liquid should acquire a brownish-green color (due to *tannic acid*).

With lead acetate T.S., Red Wine forms a heavy precipitate which may vary in color from bluish-green to green.

If 2 Cc. of Red Wine be mixed, in a test-tube, with 2 drops of chloroform and 4 Cc. of normal potassium hydrate V.S., and the mixture carefully heated, the disagreeable odor of isonitril should not become perceptible (absence of various aniline colors).

If 50 Cc. of Red Wine be treated with a slight excess of ammonia water, the liquid should acquire a green or brownish-green color; if it be then well shaken with 25 Cc. of ether, the greater portion of the ethereal layer removed, and evaporated in a porcelain capsule with an excess of acetic acid and a few fibres of uncolored silk, the latter should not acquire a crimson or violet color (absence of *fuchsine*).

If 25 Cc. of Red Wine, heated to about 45° C. (113° F.), be well agitated with 25 Gm. of manganese dioxide, the liquid filtered off and acidulated with hydrochloric acid, it should not acquire a red color (absence of *sulpho-fuchsine*).

Tested by the following method, Red Wine should be found to contain not less than 10 nor more than 14 per cent., by weight (equivalent to 12.4 to 17.3 per cent. by volume), of absolute alcohol:

Take the specific gravity (to four decimals) of a sufficient portion of the Red Wine accurately measured at the temperature of 15.6° C. (60° F.), evaporate the Wine in a tared capsule to one-third of its original weight, cool, and add water until the liquid measures its original volume at 15.6° C. (60° F.); then take the specific gravity (to four decimals) again. The difference between the two specific gravities deducted from 1.0000 corresponds to the specific gravity of an alcohol containing the same percentage of absolute alcohol, by weight or volume, as the Wine under examination, the corresponding percentage being ascertained by referring to the alcoholometric tables.

VITELLUS.

YOLK OF EGG.

The yolk of the egg of *Gallus Bankiva*, var. *domestica* Temminck (class *Aves*; order *Gallinæ*).

Preparation: Glyceritum Vitelli.

XANTHOXYLUM.

XANTHOXYLUM.

[PRICKLY ASH.]

The bark of *Xanthoxylum americanum* Miller, and of *Xanthoxylum Clava-Herculis* Linné (nat. ord. *Rutaceæ*).

Xanthoxylum americanum (Northern Prickly Ash) is in curved or quilled fragments, about 1 Mm. thick; outer surface brownish-gray, with whitish patches, and minute, black dots, faintly furrowed, with some brown, glossy, straight, two-edged spines, linear at the base, and about 5 Mm. long; inner surface whitish, smooth; fracture short, non-fibrous, green in the outer and yellowish in the inner layer; inodorous; taste bitterish, very pungent.

Xanthoxylum Clava-Herculis (Southern Prickly Ash) resembles the preceding, but is about 2 Mm. thick, and is marked by many conical, corky projections, sometimes 2 Cm. high, and by stout, brown spines, rising from a corky base.

Xanthoxylum should not be confounded with the bark of *Aralia spinosa* Linné (nat. ord. *Araliaceæ*), which is nearly smooth externally, and beset with slender prickles in transverse rows.

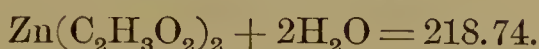
Preparation: Extractum Xanthoxyli Fluidum.

ZEA.**ZEA.**

[CORN-SILK.]

The styles and stigmas of *Zea Mays* Linné (nat. ord. *Gramineæ*).

Thread-like ; about 15 Cm. long, and 0.5 Mm. broad, yellowish or greenish, soft-silky, finely hairy, and delicately veined longitudinally ; inodorous ; taste sweetish.

ZINCI ACETAS.**ZINC ACETATE.**

Zinc Acetate should be kept in well-stoppered bottles.

Soft, white, six-sided, monoclinic plates, of a pearly lustre, having a faintly acetous odor, and an astringent, metallic taste. Exposed to the air, the salt gradually effloresces, and loses some of its acid.

Soluble, at 15° C. (59° F.), in 2.7 parts of water, and in 36 parts of alcohol ; in 1.5 parts of boiling water, and in somewhat less than 3 parts of boiling alcohol. Protracted boiling with water renders the salt less soluble, acid being lost and a basic salt formed.

When heated, the salt is partially fused, losing water and acid. At a higher temperature it is decomposed, evolving acetone and other combustible vapors, and leaving a residue of zinc oxide.

The aqueous solution reddens litmus paper.

In the aqueous solution (1 in 20) of the salt, hydrogen sulphide T.S., as well as ammonium sulphide T.S., produces a pure white precipitate ; potassium ferrocyanide T.S. also causes a white precipitate.

Potassium hydrate T.S., or ammonium carbonate T.S., when added in small quantity, produces a white precipitate, which dissolves upon the addition of an excess of the reagent.

The addition of a little ferric chloride T.S. produces a red color.

The aqueous solution (1 in 20), acidulated with hydrochloric acid, should not be colored or rendered turbid by an equal volume of hydrogen sulphide T.S. (absence of *arsenic*, *cadmium*, *lead*, *copper*, etc.).

If the aqueous solution be completely precipitated by hydrogen sulphide T.S. (without having been acidulated), the filtrate should, after evaporation, leave no fixed residue (absence of *aluminum*, *iron*, *alkalies*, *alkaline earths*, etc.).

The aqueous solution should remain perfectly clear after the addition of either barium chloride T.S. (absence of *sulphate*), or silver nitrate T.S. (absence of *chloride*).

ZINCI BROMIDUM.**ZINC BROMIDE.**

Zinc Bromide should be kept in small, glass-stoppered bottles.

A white, granular powder, odorless, and having a sharp, saline, and metallic taste. Very deliquescent.

Readily soluble in water and alcohol.

When heated to 394° C. (741.2° F.), the salt fuses, and, with careful increase of heat, may be sublimed in the form of needle-shaped prisms.

The aqueous solution gives a slightly acid reaction with litmus paper.

A 5-per-cent. aqueous solution of the salt yields a pure white precipitate with hydrogen sulphide T.S., ammonium sulphide T.S., or potassium ferrocyanide T.S.

Silver nitrate T.S. produces a yellowish-white precipitate insoluble in ammonia water.

If a few drops of copper sulphate T.S. be mixed with 5 Cc. of the aqueous solution (1 in 20) of Zinc Bromide, and then some sulphuric acid be carefully poured into the mixture so as to form a separate layer, a deep brownish-red color will appear at the line of contact, and will disappear when the mixture is shaken.

If to the aqueous solution (1 in 20) a little starch T.S. be added, and then some chlorine water, drop by drop, the liquid should assume a pure yellow color, free from any shade of blue (absence of *iodine*).

After acidulation with hydrochloric acid, the aqueous solution should not be colored or rendered turbid by the addition of an equal volume of hydrogen sulphide T.S. (absence of *arsenic, cadmium, lead, copper, etc.*).

On adding ammonium carbonate T.S. to the aqueous solution of Zinc Bromide, a white precipitate is produced which should completely redissolve in an excess of the reagent (absence of *iron, aluminum, calcium, etc.*).

If from this solution in ammonium carbonate T.S. all the zinc be precipitated by ammonium sulphide T.S., the filtrate should leave no fixed residue on evaporation (absence of *alkalies, magnesium, etc.*).

If 0.3 Gm. of the dry salt be dissolved in 10 Cc. of water, and 2 drops of potassium chromate T.S. be added, it should require 26.7 Cc. of decinormal silver nitrate V.S. to produce a permanent red color (corresponding to not less than 99.95 per cent. of the pure salt).

ZINCI CARBONAS PRÆCIPITATUS.

PRECIPITATED ZINC CARBONATE.

An impalpable, white powder, of somewhat variable chemical composition, without odor or taste. Permanent in the air.

Insoluble in water or alcohol; soluble in diluted acids with copious effervescence; also soluble in ammonia water, and in ammonium carbonate T.S.

When strongly heated, the salt loses water and carbon dioxide, and leaves a residue of zinc oxide, which is yellow while hot, but becomes white on cooling.

When a small portion of the salt is moistened with a drop of cobaltous nitrate T.S., and heated before the blowpipe, it will assume a vivid green color.

For making tests of identity and purity, add 10 Cc. of diluted sulphuric acid and 10 Cc. of water to 1.25 Gm. of the salt, and, after effervescence has ceased, remove the undissolved excess by filtration.

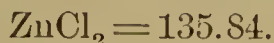
In a portion of the filtrate a pure white precipitate is produced by potassium ferrocyanide T.S., or by ammonium sulphide T.S.

In another portion of the filtrate, acidulated with hydrochloric acid, no color or turbidity should be produced by the addition of an equal volume of hydrogen sulphide T.S. (absence of *arsenic, cadmium, lead, copper, etc.*).

Another portion of the filtrate should yield with ammonium carbonate T.S. a white precipitate, which should redissolve completely in an excess of the reagent (absence of *iron, aluminum, calcium, etc.*).

No insoluble residue should be left, if 0.5 Gm. of Zinc Carbonate be dissolved in 10 Cc. of diluted sulphuric acid (absence of *lead*).

If 1 Gm. of the salt be placed in a flask with 10 Cc. of boiling water and 2 drops of phenolphthalein T.S. be added, not more than 1 Cc. of decinormal oxalic acid V.S. should be required to discharge the red color (limit of *alkali*).

ZINCI CHLORIDUM.**ZINC CHLORIDE.**

Zinc Chloride should be kept in small, glass-stoppered bottles.

A white, granular powder, or porcelain-like masses, irregular, or moulded into pencils, odorless, of such intensely caustic properties as to make tasting dangerous, unless the salt be dissolved in much water, when it has an astringent, metallic taste. Very deliquescent.

Soluble in about 0.3 part of water at 15° C. (59° F.), forming a clear solution, which, on protracted boiling, deposits a basic salt; very soluble in alcohol.

When heated to 115° C. (239° F.), Zinc Chloride fuses to a clear liquid. At a higher temperature it is partly volatilized in dense, white fumes, and partly decomposed, leaving a residue of zinc oxide.

The aqueous solution reddens blue litmus paper.

A 5-per-cent. aqueous solution of the salt yields with potassium ferrocyanide T.S. a pure white precipitate, and with ammonium carbonate T.S. a white precipitate, which redissolves in an excess of the reagent.

Silver nitrate T.S. produces a white precipitate insoluble in nitric acid.

The aqueous solution (1 in 20) should be clear, or at most only very slightly opalescent; and, if it be mixed with an equal volume of alcohol, a single drop of hydrochloric acid should suffice to render 10 Cc. of the mixture perfectly clear (limit of *oxychloride*).

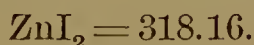
If to the aqueous solution, acidulated with hydrochloric acid, an equal volume of hydrogen sulphide T.S. be added, it should not become colored or turbid (absence of *arsenic, cadmium, lead, copper*, etc.).

If ammonium carbonate T.S. be added to the solution, the precipitate should be of a pure white color, and redissolve completely in an excess of the reagent (absence of *iron, aluminum, calcium*, etc.).

If from this solution in ammonium carbonate T.S. the zinc be completely precipitated by ammonium sulphide T.S., the filtrate should leave no fixed residue on evaporation (absence of *alkalies, magnesium*, etc.).

The aqueous solution should not be rendered turbid by the addition of barium chloride T.S. (absence of *sulphate*).

If 0.3 Gm. of dry Zinc Chloride be dissolved in 10 Cc. of water, and 2 drops of potassium chromate T.S. be added, it should require 44.1 Cc. of decinormal silver nitrate V.S. to produce a permanent red color (corresponding to not less than 99.84 per cent. of the pure salt).

ZINCI IODIDUM.**ZINC IODIDE.**

Zinc Iodide should be kept in small, glass-stoppered bottles.

A white, granular powder, odorless, and having a sharp, saline and metallic taste. Very deliquescent, and liable to absorb oxygen from the air, and to become brown from liberated iodine.

Readily soluble in water, alcohol, or ether.

When heated to about 446° C. (834.8° F.), the salt fuses to a colorless liquid, and at a higher temperature sublimes, forming quadratic needles, while a small part is decomposed and leaves a residue of zinc oxide.

The aqueous solution reddens blue litmus paper.

A 5-per-cent. aqueous solution of the salt yields a pure white precipitate with potassium ferrocyanide T.S., or with ammonium sulphide T.S.

With silver nitrate T.S. it yields a pale yellow precipitate, insoluble in ammonia water; with mercuric chloride T.S. a scarlet-red precipitate, soluble in potassium iodide T.S.

The aqueous solution, acidulated with hydrochloric acid, should not be colored or rendered turbid by hydrogen sulphide T.S. (absence of *arsenic, cadmium, lead, copper*, etc.); nor by barium chloride T.S. (absence of *sulphate*).

If ammonium carbonate T.S. be added to the aqueous solution, a pure white precipitate will form, which should redissolve completely in an excess of the reagent (absence of *iron, aluminum, calcium*, etc.).

If from the solution in ammonium carbonate T.S. all the zinc be precipitated by ammonium sulphide T.S., the filtrate should leave no fixed residue on evaporation (absence of *alkalies, magnesium*, etc.).

If 0.5 Gm. of dry Zinc Iodide be dissolved in 10 Cc. of water, and 2 drops of potassium chromate T.S. be added, not more than 31.4 Cc. nor less than 31.0 Cc. of decinormal silver nitrate V.S. should be required to produce a permanent red color (31.4 Cc. corresponding to 100 (99.9) per cent., and 31.0 Cc. to 98.62 per cent., of pure Zinc Iodide).

ZINCI OXIDUM.

ZINC OXIDE.



Zinc Oxide should be kept in well-stoppered bottles.

An amorphous, white powder, without odor or taste. It gradually absorbs carbon dioxide from the air.

Insoluble in water or alcohol. Soluble, without effervescence, in diluted acids; also in ammonia water, and in ammonium carbonate T.S.

When heated, it assumes a yellow color, which disappears again on cooling.

If a small portion of the Oxide be moistened with a drop of cobaltous nitrate T.S., and heated before the blowpipe, it will assume a vivid green color.

For making tests of identity and purity, digest 1 Gm. of Zinc Oxide, during one hour, with occasional agitation, in a mixture of 10 Cc. of diluted sulphuric acid and 10 Cc. of water; then remove the undissolved zinc oxide by filtration.

In a portion of the filtrate a pure white precipitate is produced by potassium ferrocyanide T.S., or by ammonium sulphide T.S.

In another portion of the filtrate, acidulated with hydrochloric acid, no color or turbidity should be produced by an equal volume of hydrogen sulphide T.S. (absence of *arsenic, cadmium, lead, copper*, etc.).

Another portion of the filtrate should yield with ammonium carbonate T.S. a pure white precipitate, which should redissolve completely in an excess of the reagent (absence of *iron, aluminum, calcium*, etc.).

If from this solution in ammonium carbonate T.S. the zinc be completely precipitated by ammonium sulphide T.S., the filtrate should, on evaporation, leave no fixed residue (absence of *alkalies, magnesium*, etc.).

In another portion of the filtrate silver nitrate T.S. should not produce a turbidity (absence of *chloride*).

If Zinc Oxide be agitated for some time with water, and a drop of phenolphthalein T.S. be added, no red color should appear (absence of *alkaline carbonate*, etc.).

If 10 Cc. of diluted sulphuric acid be added to 0.5 Gm. of Zinc Oxide, no effervescence should occur (absence of *carbonate*), and a perfectly clear solution should result (absence of *lead, silicate*, etc.).

If Zinc Oxide be dissolved in diluted hydrochloric acid, the solution should remain perfectly clear after the addition of barium chloride T.S. (absence of *sulphate*).

Preparation: Unguentum Zinci Oxidi.

ZINCI PHOSPHIDUM.

ZINC PHOSPHIDE.



Zinc Phosphide should be kept in small, glass-stoppered vials.

A gritty powder of a dark gray color, or crystalline fragments of a dark, metallic lustre, and having a faint odor and taste of phosphorus. In contact with the air it slowly emits phosphorous vapor.

Insoluble in water or alcohol. Soluble in diluted hydrochloric or sulphuric acid with evolution of hydrogen phosphide.

When strongly heated, with exclusion of air, it melts, and finally sublimes. When heated in air, it becomes oxidized to zinc phosphate.

If 0.5 Gm. of Zinc Phosphide be dissolved in 15 Cc. of diluted hydrochloric acid, heat being applied to expel all of the hydrogen phosphide gas, a clear solution should result, leaving no residue (absence of *insoluble impurities*).

A portion of this solution should yield a pure white precipitate with potassium ferrocyanide T.S. (absence of *iron* or *copper*); or with ammonium sulphide T.S. (absence of *lead* or *copper*).

If another portion of this solution be mixed with an equal volume of hydrogen sulphide T.S., no color or turbidity should appear (absence of *arsenic*, *cadmium*, *lead*, *copper*, etc.).

ZINCI SULPHAS.

ZINC SULPHATE.



Zinc Sulphate should be kept in well-stoppered bottles.

Colorless, transparent, rhombic crystals, without odor, and having an astringent, metallic taste. Efflorescent in dry air.

Soluble in 0.6 part of water at 15° C. (59° F.), and in 0.2 part of boiling water; also soluble in about 3 parts of glycerin; insoluble in alcohol.

When rapidly heated, the salt melts. At a higher temperature it is partly decomposed, losing both water and sulphuric acid. When very gradually heated to 50° C. (122° F.), it loses 5 molecules of its water (31.3 per cent.), without melting. At 100° C. (212° F.) a sixth molecule is lost, while the last may be removed by a current of dry air at 110° C. (230° F.).

The aqueous solution gives an acid reaction with litmus paper.

A 5-per-cent. aqueous solution yields a pure white precipitate with potassium ferrocyanide T.S.; also with ammonium sulphide T.S., and with barium chloride T.S.

If a small portion of the salt be moistened with a drop of cobaltous nitrate T.S., and heated before the blowpipe, it will assume a vivid green color.

No residue should be left on dissolving 1 Gm. of the salt in 20 Cc. of water (absence of *lead* and *other insoluble matters*).

The aqueous solution (1 in 20), after being acidulated with hydrochloric acid, should not be colored or rendered turbid by an equal volume of hydrogen sulphide T.S. (absence of *arsenic*, *cadmium*, *copper*, etc.).

The aqueous solution should yield with ammonium carbonate T.S. a pure white precipitate, which should redissolve completely in an excess of the reagent (absence of *iron*, *aluminum*, *calcium*, etc.).

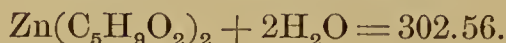
If from this solution in ammonium carbonate T.S. the zinc be completely precipitated by ammonium sulphide T.S., the filtrate should leave no fixed residue on evaporation (absence of *alkalies*, *magnesium*, etc.).

The aqueous solution (1 in 20) should not be rendered turbid by silver nitrate T.S. (absence of *chloride*).

If 1 Gm. of Zinc Sulphate, in small fragments, be agitated for some time with 10 Cc. of alcohol, the filtrate should not redden moistened blue litmus paper (absence of *free acid*).

ZINCI VALERIANAS.

ZINC VALERIANATE.



Zinc Valerianate should be kept in small, well-stoppered bottles.

White, pearly scales, having the odor of valerianic acid, and a sweetish, astringent, and metallic taste. On exposure to the air, it slowly loses valerianic acid.

Soluble, at 15° C. (59° F.), in about 100 parts of water, and in 40 parts of alcohol; somewhat more soluble in absolute alcohol. Boiling renders the solution turbid from loss of acid and formation of a basic salt.

When heated, the salt melts. At a higher temperature it is decomposed, giving off inflammable vapors, and finally leaving a residue of zinc oxide.

The aqueous solution reddens blue litmus paper.

If 0.5 Gm. of Zinc Valerianate be dissolved in a mixture of 0.5 Cc. of hydrochloric acid and 4.5 Cc. of water, the valerianic (isovalerianic) acid will be liberated, and float as an oily layer on the surface of the liquid.

After its removal, the clear solution should be neither colored nor rendered turbid by the addition of an equal volume of hydrogen sulphide T.S. (absence of *arsenic, cadmium, lead, copper*, etc.).

Zinc Valerianate should dissolve without residue in ammonia water (absence of *iron*, etc.).

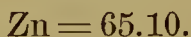
If from this solution the zinc be completely precipitated by ammonium sulphide T.S., the precipitate should have a pure white color, and the filtrate should leave no fixed residue on evaporation (absence of *alkalies, magnesium*, etc.).

If 0.5 Gm. of Zinc Valerianate be triturated with 2 Cc. of water and 0.2 Cc. of ferric chloride T.S. added, the filtrate should not show a red color (absence of *acetate*).

If a concentrated solution of copper acetate in water be added to a concentrated, aqueous solution of Zinc Valerianate, the mixture should remain perfectly clear (absence of *butyrate*).

ZINCUM.

ZINC.



Metallic Zinc in the form of thin sheets, or in irregular, granulated pieces, or moulded into thin pencils, or in a state of fine powder.

A bluish-white metal, showing a crystalline fracture, and having a specific gravity ranging from 6.9 when it is cast, to 7.2 after it is rolled.

Soluble in diluted sulphuric or hydrochloric acid with evolution of hydrogen gas.

When heated above 100° C. (212° F.), and not above 150° C. (302° F.), the metal becomes malleable and ductile; above 200° C. (392° F.) it becomes sufficiently brittle to be powdered in an iron mortar; at 412° to 415° C. (773.6° to 779° F.) it melts, and at 940° C. (1724° F.) it boils and may be readily distilled.

When Zinc is dissolved in diluted hydrochloric acid, the hydrogen gas which is evolved should not have any disagreeable odor, nor should it color a strip of paper moistened with lead acetate T.S. (absence of *sulphur*), or with silver nitrate T.S. (absence of *arsenic, antimony, phosphorus*).

The solution should be clear and colorless, and should yield a pure white precipitate with potassium ferrocyanide T.S., and with ammonium sulphide T.S.

If an equal volume of hydrogen sulphide T.S. be added to the solution, neither color nor turbidity should be perceptible (absence of *arsenic, cadmium, lead, copper*, etc.).

If ammonia water be added to the solution, a white precipitate should form, which should redissolve completely in an excess of the reagent, yielding a clear, colorless solution (absence of more than traces of *iron, lead, copper*, etc.).

ZINGIBER.

GINGER.

The rhizome of *Zingiber officinale* Roscoe (nat. ord. *Scitamineæ*).

About 5 to 10 Cm. long, 10 to 15 Mm. broad, and 4 to 8 Mm. thick, flattish, on one side lobed or clavately branched; deprived of the corky layer; pale buff-colored, striate, breaking with a mealy, rather fibrous fracture, showing numerous small, scattered resin-cells and fibro-vascular bundles, the latter enclosed by a nucleus sheath; agreeably aromatic, and of a pungent and warm taste.

Preparations: Extractum Zingiberis Fluidum. Oleoresina Zingiberis. Pulvis Aromaticus. Pulvis Rhei Compositus. Tinctura Zingiberis.

REAGENTS.

REAGENTS.

I. PRELIMINARY REMARKS.

Official Substances as Reagents.—Some official substances (chemicals, chemical solutions, etc.) are sufficiently pure to be used as reagents, if they comply with the tests of purity prescribed by the Pharmacopœia. In the case of others, the presence of certain impurities, though immaterial for their use as medicines, renders their employment as reagents unsuitable. Whenever a greater degree of purity is required than is provided for by the text of the Pharmacopœia, it will be specially mentioned in the following lists.

Abbreviations and Signs Used:

T.S. = Test-solution.

V.S. = Volumetric solution.

$\frac{N}{1}$ = Normal (see under "Volumetric Solutions" in List III).

$\frac{N}{2}$ = Seminormal ; $\frac{N}{10}$ = Decinormal ; $\frac{N}{100}$ = Centinormal.

$\frac{2}{N}$ = Double-normal (sometimes written : .2 N).

★ (asterisk) *in front* of a figure denotes that the quantity or value expressed by the figure is approximate. In the case of a volumetric solution, for instance, ★25 Cc. means "about 25 Cc.," and this is to be interpreted as standing for "24.5 to 25.5 Cc.," the allowable variation in such cases being 2 per cent. either way. In the text of the Pharmacopœia, this is expressed by saying "about 25 Cc.," or "about 16 per cent. of iron," etc.

Keeping of Reagents.—Reagents should be kept in bottles made of glass free from lead and arsenic, and proof against corrosion by acids and alkalies, preferably in those made of Bohemian glass.

The bottles should be closed by well-ground glass stoppers. Stoppers of bottles containing alkali hydrates, ammonium sulphide, ammonia water, tannic acid, and other substances rapidly attacking ground glass surfaces, should be lubricated with a thin film of petrolatum.

Reagents easily affected by light, such as hydrogen sulphide T.S., ammonium sulphide T.S., chlorine water, etc., should be kept in bottles made of dark amber-colored glass.

NOTE.—As some of the following test-solutions are in certain cases directed in definite quantities in lieu of the regular volumetric solutions, it is important that they should always be prepared of the *exact strength prescribed*.

II. LIST OF REAGENTS AND TEST-SOLUTIONS.

NOTE.—The reagents are arranged in alphabetical order. The test-solutions are usually mentioned in connection with the principal chemical or other substance from which they are prepared. The volumetric solutions will be found in List III (Nos. 116–135).

Whenever *water* is required or mentioned as a solvent in the tests given in the Pharmacopœia, or in the preparation of any reagent, it is understood that *distilled water* shall be used.

1. **Absolute Alcohol.**—Ethyl alcohol, $C_2H_5OH = 45.9$.—Use the official absolute alcohol [*Alcohol Absolutum*].

2. **Acetic Acid.**— $HC_2H_3O_2 = 59.86$.—Use the official acetic acid [*Acidum Aceticum*].

3. **Albumen Test-Solution.**—Carefully separate the white of a hen's egg from the yolk, shake it thoroughly with 100 Cc. of water, and filter. This solution should be freshly made when required.

4. **Aluminum.**—Metallic aluminum, $Al = 27.04$, in the form of foil, wire, or ribbon. It should be tested for arsenic by Fleitmann's method (see below, No. 13), when no color should be imparted to the silver nitrate within two hours.

5. **Ammonia Water.**— $NH_3 = 17.01$.—Use the official ammonia water [*Aqua Ammoniæ*].

6. **Ammonium Carbonate Test-Solution.**—Dissolve 10 Gm. of ammonium carbonate, $NH_4HCO_3 \cdot NH_4NH_2CO_2 = 156.77$ [*Ammonii Carbonas*, U. S. P.], in a mixture of 10 Cc. of ammonia water and 40 Cc. of water.

For detecting arsenic sulphide in presence of antimony sulphide, the addition of ammonia water is omitted, and 10 Gm. of the salt are dissolved in a sufficient quantity of water to make 100 Cc.

7. **Ammonium Chloride Test-Solution.**—Dissolve 10 Gm. of ammonium chloride, $NH_4Cl = 53.38$ [*Ammonii Chloridum*, U. S. P.], in enough water to make 100 Cc.

8. **Ammonium Molybdate Test-Solution.**—Dissolve 1 Gm. of finely powdered ammonium molybdate, $(\text{NH}_4)_2\text{MoO}_4 = 195.76$, in 6.7 Cc. of hot water, using a little ammonia water, if necessary, to effect solution. Then gradually pour the liquid into a mixture of 3.3 Cc. of nitric acid (spec. grav. 1.414) and 3.4 Cc. of water. Preserve the test-solution in the dark, and, if a sediment should form in it after some days, carefully decant the clear solution from it.

9. **Ammonium Oxalate Test-Solution.**—Dissolve 4 Gm. of pure, crystallized ammonium oxalate, $(\text{NH}_4)_2\text{C}_2\text{O}_4 + \text{H}_2\text{O} = 141.76$, free from metals, chloride, and sulphate, in enough water to make 100 Cc. Or, dissolve 4 Gm. of pure oxalic acid (see below, No. 121) in 100 Cc. of water, add 20 Cc. of ammonia water, boil to expel excess of ammonia, and bring the volume to 113 Cc.

On evaporating a portion of the test-solution, and igniting the residue, it should be completely volatilized (absence of *fixed impurities*).

10. **Ammonium Phosphate Test-Solution.**—Dissolve 1 Gm. of ammonium phosphate, $(\text{NH}_4)_2\text{HPO}_4 = 131.82$, together with 2 Cc. of ammonia water, in enough water to make 100 Cc. This solution does not keep well. It should be freshly made when required, or frequently renewed.

10b. **Ammonium Sulphate.**— $(\text{NH}_4)_2\text{SO}_4 = 131.84$.—The purified salt, leaving no residue upon ignition.

11. **Ammonium Sulphide Test-Solution.**—Saturate 3 parts of pure ammonia water with pure, washed hydrogen sulphide, and add to the solution (which now contains ammonium sulphhydrate, $\text{NH}_4\text{HS} = 50.99$) 2 parts of ammonia water, which converts the greater portion of the ammonium sulphhydrate into ammonium sulphide, $(\text{NH}_4)_2\text{S} = 68.0$. The solution should be perfectly clear and colorless, and, on being evaporated, leave no residue. It should not be rendered turbid either by magnesium sulphate T.S. (absence of *free ammonia*), or by calcium chloride T.S. (absence of *ammonium carbonate*). It should be protected against air and light by being kept in small, dark amber-colored bottles, in a dark place. As soon as a notable deposit of sulphur has made its appearance in the solution, it should be rejected.

Ammonium polysulphide test-solution is occasionally required. This is a yellow liquid, prepared by dissolving a small quantity of pure sulphur in the preceding, colorless ammonium sulphide test-solution.

12. **Arsenic Test, Bettendorff's.**—To a small quantity of the liquid to be tested, which should contain much pure concentrated hydrochloric acid, or should be a solution of the substance to be tested in pure, concentrated hydrochloric acid, add an equal volume of a saturated solution of freshly prepared stannous chloride in pure, concentrated hydrochloric acid, together with a small piece of pure tin-foil. The presence of arsenic is revealed by the production of a brown color or brown precipitate, the appearance of which is hastened by a gentle heat (see Stannous Chloride, No. 108).

13. **Arsenic Test, Fleitmann's.**—Into a test-tube of at least 15 Cm. in length, and 15 to 18 Mm. in diameter, place a single, solid piece of zinc (see below, No. 115), weighing about 1 to 1.25 Gm., and add about 5 Cc. of potassium hydrate T.S. [*Liquor Potassæ*, U. S. P.], both ingredients having previously been proven free from arsenic by having been subjected, *alone*, to the test about to be described, during at least two hours, with negative result. Now add the liquid to be tested, which must not contain any free acid, nor very materially increase the volume of the contents of the test-tube. Immediately secure over the mouth of the test-tube a previously prepared cap made of three thicknesses of pure filter paper free from dust, and apply to the upper filter paper a drop of a saturated, aqueous solution of silver nitrate acidulated with nitric acid (see Silver Nitrate T.S., No. 96). Then place the tube at once, upright, into a box containing sand heated to about 90° C. (194° F.), and fitted with a cover, so as to exclude light and dust, and permit the reaction to proceed for such a time as may be specially prescribed in each case. The presence of arsenic (but not of antimony) is revealed by the production, upon the moistened paper cap, of a brown or black stain. In absence of arsenic, if the test has been carefully conducted, the spot will remain colorless.

In place of zinc, metallic aluminum, best in form of wire, cut into small pieces, may be employed (*Gatehouse's* modification). The method of testing, and the results, are the same as in Fleitmann's test.

14. **Arsenic Test, Gutzeit's.**—Into a test-tube of at least 15 Cm. in length, and 15 to 18 Mm. in diameter, place a single, solid piece of zinc (see below, No. 115), weighing about 1 to 1.25 Gm., and add about 5 Cc. of a mixture, previously prepared and kept in readiness for this purpose, of 10 Cc. of pure sulphuric acid of spec. grav. 1.835. and 190 Cc. of water, the ingredients having previously been proven free from arsenic by having been subjected, *alone*, to the test about to be described, during at least two hours, with negative result. Now add

the liquid to be tested, which should not be alkaline, nor exceed 1 Cc. About 1 Cm. below the open end of the test-tube insert a loose plug, about 1 Cm. long, of glass-wool or cotton, which has been moistened with 0.5 Cc. of lead acetate T.S. Then secure over the mouth a cap made of three thicknesses of clean filter paper, and apply to the upper one a drop of a saturated, aqueous solution of silver nitrate, acidulated with nitric acid (see Silver Nitrate T.S., No. 96). Place the tube into a box to exclude light, and let the reaction proceed as long as may be prescribed in each case. The presence of arsenic is shown by the production, upon the moistened paper cap, of a bright yellow stain which becomes black or brown by application of water. Antimony colors the spot black or brown at once without showing a yellow color while dry. In this case, traces of arsenic may be overlooked; it is therefore advisable to subject a fresh portion of the specimen to Fleitmann's test (see No. 13), which responds only to arsenic. If the plug moistened with lead acetate T.S. be strongly colored, so that doubt exists whether the coloration be due to metallic silver reduced by arsenic, or to silver sulphide, produced by an escape of H_2S through the plug, moisten the silver stain with diluted nitric acid, which will dissolve the metallic silver reduced by arsenic, but will not affect the black silver sulphide. Or else, put on a new cap of filtering paper, moistened with a drop of lead acetate T.S. If this remain colorless, sulphide is absent.

15. Barium Carbonate.—Pure barium carbonate, $BaCO_3 = 196.75$, prepared by dissolving 12 parts of pure, crystallized barium chloride in 20 parts of boiling water, then adding a solution of 5 parts of ammonium carbonate in 10 parts of boiling water, and afterwards 5 parts of ammonia water; finally washing the precipitate thoroughly and drying it.

16. Barium Chloride Test-Solution.—Prepared from pure barium chloride, $BaCl_2 + 2H_2O = 243.56$. The aqueous solution of the salt should be perfectly neutral, and should not yield a precipitate with hydrogen sulphide T.S. or ammonium sulphide T.S. (absence of *metals*, etc.). The aqueous solution, after being precipitated by diluted sulphuric acid in slight excess, yields a filtrate which should not leave any permanent residue when evaporated and heated on platinum-foil (absence of *other fixed bases and salts*). Diluted alcohol, after remaining in contact with it for several hours, should, upon ignition, show a pure yellowish-green colored flame, without red streaks (absence of *traces of strontium*). To prepare the *test-solution*, dissolve 12.2 Gm. of

the salt in enough water to make 100 Cc. (This solution is of normal strength = $\frac{N}{1}$ V.S., so as to permit of its use for volumetric purposes also.)

17. Barium Hydrate Test-Solution.—A saturated solution of barium hydrate [barium hydroxide, $\text{Ba}(\text{OH})_2 = 170.82$] in water. This solution rapidly absorbs carbon dioxide from the air. It is preferably prepared freshly as wanted.

18. Barium Nitrate Test-Solution.—Prepared from pure barium nitrate, $\text{Ba}(\text{NO}_3)_2 = 260.68$. This salt should respond to the same tests as barium chloride (see No. 16). In addition, its aqueous solution, slightly acidulated with nitric acid, should not be rendered turbid by silver nitrate T.S. (absence of *chloride*). To prepare the *test-solution*, dissolve 1 Gm. of the salt in water to make 15.3 Cc. (This solution is of half normal strength = $\frac{N}{2}$ V.S., so as to permit of its use for volumetric purposes also.)

19. Benzin, or Petroleum Ether.—Use the official benzin [*Benzinum*].

20. Benzol, or Benzene.—Benzol, $\text{C}_6\text{H}_6 = 77.82$, is a colorless, transparent liquid of a peculiar, aromatic odor, of a spec. grav. of 0.8846 at 15° C. (59° F.), congealing at 0° C. (32° F.), and boiling at 80.37° C. (176.7° F.). It is insoluble in water, but soluble in 4 parts of alcohol, and in ether. In concentrated sulphuric acid it should dissolve without producing a color. On shaking 2 Cc. of benzol with 0.5 Cc. of sulphuric acid and 1 drop of fuming nitric acid, no green or blue tint should be produced (absence of *thiophene*).

21. Brazil Wood Test-Solution.—See under *Indicators* (No. 49).

22. Bromine Water (Bromine Test-Solution), $\text{Br} = 79.76$.—An aqueous solution of bromine [*Bromum*, U. S. P.], prepared by dissolving 1 Cc. of bromine in enough water to make 100 Cc.

23. Calcium Chloride Test-Solution.—Dissolve 10.925 Gm. of crystallized calcium chloride, $\text{CaCl}_2 + 6\text{H}_2\text{O} = 218.41$, in enough water to make 100 Cc. (This solution is of normal strength = $\frac{N}{1}$ V.S., so as to permit of its use for volumetric purposes also.)

24. Calcium Hydrate Test-Solution (Lime Water), $\text{Ca}(\text{OH})_2 = 73.83$.—Use the official lime water [*Liquor Calcis*].

25. Calcium Sulphate Test-Solution.—Introduce transparent crystals of native gypsum (selenite), $\text{CaSO}_4 + 2\text{H}_2\text{O} = 171.65$, into a

flask filled with water, and decant the clear, saturated solution when required. One part of gypsum requires, at 15° C. (59° F.), 398 parts of water for solution.

26. Carbon Disulphide.—Use the official carbon disulphide [*Carboni Disulphidum*].

27. Chlorine Water (Chlorine Test-Solution), $\text{Cl} = 35.37$.—Use the official chlorine water [*Aqua Chlorig*]. Since it rapidly deteriorates by keeping, it should be frequently renewed, or freshly prepared when required.

28. Chloroform, $\text{CHCl}_3 = 119.08$.—Use the official chloroform [*Chloroformum*].

29. Cobaltous Nitrate Test-Solution.— $\text{Co}(\text{NO}_3)_2 + 6\text{H}_2\text{O} = 290.14$. The crystallized, commercial salt is sufficiently pure, if, after it is dissolved in water, and the cobalt completely precipitated by ammonium sulphide T.S., the filtrate leaves no residue on evaporation. To make the *test-solution*, dissolve 1 Gm. of the salt in 10 Cc. of water.

30. Cochineal Test-Solution.—See under *Indicators* (No. 50).

31. Copper (Metallic Copper), $\text{Cu} = 63.18$, in form of wire, foil, or turnings. The commercial article, brightened, if necessary, by scouring with diluted hydrochloric acid, is suitable for all purposes except testing for arsenic. If required for this purpose, the absence of arsenic must first be proven. A small portion (about 0.5 Gm.) of the copper is to be dissolved in hot, concentrated sulphuric acid, and this solution subjected to Gutzeit's test (see No. 14). No color should be imparted to the silver nitrate within two hours (absence of *arsenic*).

32. Cupric Ammonium Sulphate Test-Solution.—A solution of cupri-tetrammonium sulphate, $\text{Cu}(\text{NH}_3)_4\text{SO}_4 + \text{H}_2\text{O} = 245.0$. To copper sulphate T.S. add ammonia water, until the precipitate first formed is nearly, but not completely, redissolved; then filter. This solution is apt to decompose on keeping. It should be made freshly when required.

33. Cupric Sulphate Test-Solution.—Dissolve 10 Gm. of cupric sulphate, $\text{CuSO}_4 + 5\text{H}_2\text{O} = 248.8$ [*Cupri Sulphas*, U. S. P.], in enough water to make 100 Cc.

34. Cupric Tartrate Test-Solution.—See below, under Volumetric Solutions, No. 117.

35. Corallin Test-Solution.—See under *Indicators* (No. 51).

36. Diphenylamine, and Diphenylamine Test-Solution.—See under *Indicators* (No. 52).

37. Eosin Test-Solution.—See under *Indicators* (No. 53).

38. Ether.—Use the official ether [*Æther*]. It should be strictly neutral to litmus paper.

39. Ferric Ammonium Sulphate Test-Solution.—Dissolve 10 Gm. of ferric ammonium sulphate [*Ferri et Ammonii Sulphas*, U. S. P.] in enough water to make 100 Cc.

40. Ferric Chloride Test-Solution.—Dissolve 10 Gm. of ferric chloride, $\text{Fe}_2\text{Cl}_6 + 12\text{H}_2\text{O} = 539.50$ [*Ferri Chloridum*, U. S. P.], in enough water to make 100 Cc.

41. Ferrous Sulphate Test-Solution.—Dissolve a clear crystal of ferrous sulphate, $\text{FeSO}_4 + 7\text{H}_2\text{O} = 277.42$ [*Ferri Sulphas*, U. S. P.], in about 10 parts of water previously boiled to expel air. This solution should be freshly prepared immediately before use.

42. Ferrous Sulphide, $\text{FeS} = 87.86$.—A heavy solid, in form of black or brownish-black irregular masses, or fused into sticks, soluble in sulphuric or hydrochloric acid with copious evolution of hydrogen sulphide. On dissolving 2 Gm. of ferrous sulphide in pure nitro-hydrochloric acid diluted with a little water, evaporating the solution to dryness, and testing the residue for arsenic by Gutzeit's method (see No. 14), no color should be imparted to the silver nitrate within two hours.

43. Fluorescein Test-Solution.—See under *Indicators* (No. 54).

44. Gelatin Test-Solution.—Dissolve 1 Gm. of isinglass [*Ichthyocolla*, U. S. P.] in 50 Cc. of water, by the aid of a gentle heat, and filter if necessary. This solution should be freshly made when wanted for use.

45. Gold Chloride Test-Solution.—The commercial chloride of gold, usually prepared by dissolving gold in nitro-hydrochloric acid and carefully evaporating to dryness, mostly consists of aurochloric acid, $\text{HAuCl}_4 + 2\text{H}_2\text{O} = 375.1$, which is converted into neutral auric

chloride, $\text{AuCl}_3 = 302.81$, by fusing it at a temperature not exceeding 150°C . (302°F .), moistening the residue (now consisting of auric and aurous chloride) with enough hot water to produce a syrupy liquid (whereby the aurous chloride is decomposed into auric chloride and metallic gold), and then pouring off the clear liquid from the precipitate. To prepare the *test-solution*, dissolve the liquid finally obtained in the before-mentioned process in 20 volumes of water. Or, dissolve 1 Gm. of dry auric chloride in 30 Cc. of water.

46. **Hydrochloric Acid, Pure, for Tests**, $\text{HCl} = 36.37$.—In addition to the tests prescribed for this acid in the text of the Pharmacopœia, it is required to conform to the following more rigorous tests, before it can be employed as a reagent: The addition of 1 Cc. of barium chloride T.S. to 1 Cc. of the acid diluted with 9 Cc. of water should cause no turbidity within twenty-four hours (absence of *sulphuric acid*). A crystal of diphenylamine dropped into the acid should not turn blue (absence of *free chlorine*). On substituting it for sulphuric acid in Gutzeit's test, as described under No. 14, no color should be imparted to the silver nitrate within two hours (absence of *arsenic* or *antimony*).

47. **Hydrogen Sulphide**, $\text{H}_2\text{S} = 33.98$.—A gas generated by treating ferrous sulphide with diluted sulphuric acid, and washing the gas by passing it through water.

48. **Hydrogen Sulphide Test-Solution, or Hydrosulphuric Acid**, $\text{H}_2\text{S} = 33.98$.—A saturated, aqueous solution of hydrogen sulphide. To prepare about 1 liter of the solution, treat 20 Gm. of ferrous sulphide, in a suitable apparatus, with a mixture of 20 Cc. of pure sulphuric acid, spec. grav. 1.835, and 250 Cc. of water, pass the gas through a wash-bottle containing a small quantity of water, and conduct it into a bottle of the capacity of about $1\frac{1}{2}$ liters, containing 1 liter of water. When the gas is no longer absorbed, transfer the solution to small, dark amber-colored bottles, to be filled nearly to the top, pass a stream of hydrogen sulphide for a few minutes through each, and then at once stopper them tightly, and preserve them afterwards in a cool and dark place. Before putting them aside, introduce into one of these bottles a few drops of pure hydrochloric acid, and keep it in a warm place during twenty-four hours, after which time no precipitate should be found in it (absence of *arsenic*). Before any of the solution is used, it should be ascertained that it retains a strong odor of hydrogen sulphide, and that, when it is added to an equal volume of ferric chloride T.S., a copious precipitate of sulphur is formed at once.

Indicators for Acidimetry, Alkalimetry, etc.

(Nos. 49-59.)

NOTE.—Each test-solution used as *indicator* should be examined as soon as prepared, and afterwards from time to time, as to its neutrality. If necessary, it should be brought, by the cautious addition of diluted sulphuric acid, or of a dilute solution of an alkali, to such a point that, when a few drops of it are added to 25 Cc. of water, a single drop of a centinormal acid or alkali V.S., respectively, will distinctly develop the corresponding tints.

Since many of the colored test-solutions are injured by exposure to light, it is best to preserve them in dark amber-colored vials. Papers prepared with them should be kept in dark bottles or paper boxes.

49. Brazil-Wood Test-Solution.—Boil 50 Gm. of finely cut Brazil-wood [the heart-wood of *Peltophorum dubium* (Sprengel) Britton, nat. ord. *Leguminosæ*] with 100 Cc. of water during half an hour, replacing the water from time to time. Allow the mixture to cool, strain, wash the contents of the strainer with water until 100 Cc. of strained liquid are obtained, add 25 Cc. of alcohol, and filter. This solution turns purplish-red with alkalies, and yellow with acids.

50. Cochineal Test-Solution.—Macerate 1 Gm. of unbroken cochineal [*Coccus*, U. S. P.], during four days, with 20 Cc. of alcohol and 60 Cc. of water. Then filter. The color of this test-solution turns violet with alkalies, and yellowish-red with acids. As an indicator it is used chiefly when ammonia or alkaline earths are present.

51. Corallin Test-Solution.—Dissolve 1 Gm. of corallin (a coloring matter derived from coal-tar, and containing rosolic and pararosolic acids) in 10 Cc. of alcohol and enough water to make 100 Cc.

52. Diphenylamine, $(C_6H_5)_2NH = 168.65$, is in form of grayish-white or colorless crystals, of a peculiar, aromatic odor, melting at 54° C. (129.2° F.), slightly soluble in water, more soluble in acids. It is used either in the dry state, or in solution in dilute sulphuric acid, as a test for nitric acid (in sulphuric acid, water, etc.), or for chlorine (in hydrochloric acid). To test a solution for the presence of nitric acid, a small portion of it is mixed with 1 or 2 drops of diphenylamine T.S., and then concentrated sulphuric acid, *free from nitrose*, is poured in so as to form a layer beneath the solution. The presence of nitric acid is shown by a deep blue color at the zone of contact.

Diphenylamine test-solution is prepared by dissolving 0.1 Gm. of diphenylamine in 50 Cc. of diluted sulphuric acid. The solution should be colorless.

53. Eosin Test-Solution.—Dissolve 1 Gm. of commercial “yellowish” eosin [$K_2C_{20}H_6Br_4O_5$] in 30 Cc. of water. This solution is red by transmitted light, and shows a strong green fluorescence by reflected light. Acids destroy the fluorescence, and alkalis restore it.

54. Fluorescein Test-Solution.—Agitate 1 Gm. of fluorescein [$C_{20}H_{12}O_5$] with 100 Cc. of diluted alcohol, until the latter is saturated; then filter. This solution shows a strong green fluorescence, by reflected light, in presence of the least excess of an alkali.

55. Litmus Paper and Test-Solution.—Exhaust coarsely powdered litmus with boiling alcohol (which removes a peculiar, red coloring matter, erythrolitmin), and digest the residue with about an equal weight of cold water, so as to dissolve the excess of alkali present. The blue solution thus obtained, after being acidulated, may be used to make *red litmus paper*. Finally extract the residue with about 5 times its weight of boiling water, and filter. Preserve the filtrate, as *test-solution*, in wide-mouthed bottles stoppered with loose plugs of cotton to exclude dust but to admit air.

Litmus Paper, Blue.—Impregnate, with the test-solution just described, strips of white, unsized paper, free from wood-pulp, but not too porous, and dry them by suspending them on strings of clean twine.

Litmus Paper, Red.—Prepare this with the same kind of paper and in the same manner as described in the preceding paragraph. To impregnate the paper, either use the blue solution obtained from litmus, by treating the mass, after extraction by alcohol, with cold water, acidulating the same with just enough hydrochloric acid to impart to it a distinctly red tint; or, use the regular test-solution, after acidulating it in the same manner.

Neither blue nor red litmus paper should have a very intense color.

Preserve the test paper in paper boxes or bottles, so as to exclude dust and acid or ammoniacal vapors.

56. Methyl-Orange Test-Solution.—Dissolve 1 Gm. of methyl-orange [the sodium or ammonium salt of dimethylamidoazobenzol-sulphonic acid, $HC_{14}H_{14}N_3SO_3 = 304.47$; also known as helianthin, or tropæolin D, or Poirrier's Orange 3 P] in 1000 Cc. of water. Add to it, carefully, diluted sulphuric acid, in drops, until the liquid turns red and just ceases to be transparent. Then filter.

The solution acquires a yellow color when brought in contact with alkali hydrates, carbonates, or bicarbonates. Carbonic acid does not affect it, but sulphuric, hydrochloric, and other acids change its color to crimson. It is not suited for use with organic acids.

57. Phenolphthalein Test-Solution.—Dissolve 1 Gm. of phenolphthalein [$C_{20}H_{14}O_4$] in 100 Cc. of diluted alcohol. The solution is colored deep purplish-red by alkali hydrates or carbonates; bicarbonates and most other salts do not produce such color; acids render the reddened solution colorless. It is not suitable as an indicator for ammonia or bicarbonates.

Phenolphthalein Paper is prepared by impregnating white, unsized paper with the test-solution and drying it.

58. Rosolic Acid Test-Solution.—Dissolve 1 Gm. of commercial rosolic acid [chiefly methyllaurin, $C_{20}H_{16}O_3 = 303.28$] in 10 Cc. of diluted alcohol, and add enough water to make 100 Cc. The solution turns violet-red with alkalies, yellow with acids. In place of rosolic acid, commercial pæonin (also known as aurin R) [chiefly $C_{19}H_{14}O_3 = 289.31$] may be employed.

59. Turmeric Tincture.—Digest any convenient quantity of ground curcuma root [from *Curcuma longa* Linné, nat. ord. *Scitamineæ*] repeatedly with small quantities of water, and throw this liquid away. Then digest the dried residue for several days with 6 times its weight of alcohol, and filter.

Turmeric Paper.—Impregnate white, unsized paper with the tincture, and dry it. The tincture, as well as the paper, turns brown with alkalies, and the yellow color is restored by acids. Boric acid, however, even in presence of hydrochloric acid, turns the color to reddish-brown, and this is changed to bluish-black by ammonia.

60. Indigo Test-Solution.—Place 6 Gm. (3.3 Cc.) of fuming sulphuric acid into a beaker well cooled by immersion in water, and stir into it, very gradually, 1 Gm. of finely powdered Bengal indigo. Set the mixture aside for two days, then pour it into 20 Cc. of water, and decant. Or, dissolve 1 Gm. of commercial indigo-carmin (the sodium or potassium salt of sulphindigotic acid) in 150 Cc. of water.

61. Iodine Test-Solution.—For preparing the ordinary test-solution (as a reagent for starch, alcohol by iodoform test, etc.), iodine. $I = 126.53$, fulfilling the requirements of the Pharmacopœia [see

Iodum, U. S. P.], is sufficiently pure. For this purpose dissolve 1 Gm. of iodine and 3 Gm. of potassium iodide in 50 Cc. of water.

For use in volumetric analysis, or in other cases where the ordinary impurities present in official iodine are objectionable, *Purified Iodine* must be employed. See under No. 120.

62. **Iron, Metallic**, $\text{Fe} = 55.88$.—Bright and perfectly clean iron in the form of wire, sheet, or filings, according to the uses to be made of it. For making solutions of pure iron salts, fine, thin, bright wire (so-called florists' wire) should be used. For detecting copper, bright pieces of sheet iron or knitting-needles are used; for detecting nitric acid, by reduction to ammonia, iron-filings are preferable.

63. **Lead Acetate Test-Solution**.—Dissolve 10 Gm. of clear, transparent crystals of lead acetate, $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2 + 3\text{H}_2\text{O} = 378.0$ [*Plumbi Acetas*, U. S. P.], free from adhering lead carbonate, in enough water to make 100 Cc. Preserve the solution in well-stoppered bottles.

64. **Basic Lead Acetate Test-Solution**.—Use the official solution of lead subacetate [*Liquor Plumbi Subacetatis*].

65. **Litmus Paper and Test-Solution**.—See under *Indicators* (No. 55).

66. **Magnesia Mixture**.—Dissolve 10 Gm. of magnesium sulphate [*Magnesi Sulphas*, U. S. P.], and 20 Gm. of ammonium chloride [*Ammonii Chloridum*, U. S. P.], in 80 Cc. of water, add 42 Cc. of ammonia water, set the mixture aside for a few days in a well-stoppered vessel, and filter. It should never be used freshly made.

67. **Magnesium Sulphate Test-Solution**.—Dissolve 10 Gm. of magnesium sulphate, $\text{MgSO}_4 + 7\text{H}_2\text{O} = 245.84$ [*Magnesi Sulphas*, U. S. P.], in enough water to make 100 Cc.

68. **Mercuric Chloride Test-Solution**.—Dissolve 5 Gm. of mercuric chloride, $\text{HgCl}_2 = 270.54$ [*Hydrargyri Chloridum Corrosivum*, U. S. P.], in enough water to make 100 Cc.

69. **Mercuric Potassium Iodide Test-Solution**.—Use the decimal mercuric potassium iodide volumetric solution (No. 121).

70. **Alkaline Mercuric Potassium Iodide Test-Solution**. (*Nessler's Solution*.)—Dissolve 5 Gm. of potassium iodide [*Potassii Iodidum*, U. S. P.] in 5 Cc. of hot water, and add to this a hot solution of 2.5 Gm. of mercuric chloride [*Hydrargyri Chloridum Corrosivum*,

U. S. P.] in 10 Cc. of water. To the turbid, red mixture add 16 Gm. of potassium hydrate [*Potassa*, U. S. P.], dissolved in 40 Cc. of water, and finally make up the volume to 100 Cc. A surplus of red mercuric iodide deposits on cooling, and may be left in the bottle, the clear solution being decanted as needed.

71. Mercurous Nitrate Test-Solution, $\text{Hg}_2(\text{NO}_3)_2 + 2\text{H}_2\text{O} = 559.3$.—Into a porcelain capsule put 1 Gm. of pure mercury with 0.5 Cc. of pure nitric acid and 0.5 Cc. of distilled water, and place it for 24 hours into a cool, dark room. Separate and drain the crystals, and dissolve them in 100 Cc. of water. Preserve the solution in a dark amber-colored bottle, into which a small globule of mercury has been placed.

72. Methyl Alcohol, $\text{CH}_3\text{OH} = 31.93$.—For the identification of salicylic acid, the rectified, commercial wood-alcohol, having a specific gravity of about 0.820, is sufficiently pure, if it forms a clear, transparent mixture with an equal volume of distilled water.

73. Methyl-Orange Test-Solution.—See under *Indicators* (No. 56).

74. Nitric Acid, Pure, for Tests, $\text{HNO}_3 = 62.89$.—In addition to the tests prescribed for this acid in the text of the Pharmacopœia, it is required to conform to the following more rigorous test before it can be used as a reagent: On supersaturating 0.5 Cc. of the acid with pure potassium hydrate T.S., and testing a portion of this solution by Fleitmann's method (see under No. 13), no color should be imparted to the silver nitrate within two hours (absence of *arsenic*).

75. Fuming Nitric Acid (Red Fuming Nitric Acid).—The commercial acid will answer, if it is of specific gravity 1.450 or over. It should be carefully kept in glass-stoppered bottles in a cool place.

76. Oxalic Acid Test-Solution.—Use the decinormal volumetric solution (No. 123).

77. Phenolphthalein Test-Solution.—See under *Indicators* (No. 57).

78. Picric Acid Test-Solution.—Dissolve 1 Gm. of pure, distinctly crystalline picric acid (trinitrophenol), $\text{C}_6\text{H}_2(\text{NO}_2)_3\text{OH} = 228.57$, in 100 Cc. of water, cool the solution, and filter, if necessary.

79. Platinic Chloride Test-Solution.—Heat 1 Gm. of pure platinum, in chips, with 6 Cc. of concentrated hydrochloric acid to 80°C .

(186° F.), and very gradually add 1 Cc. of strong nitric acid (spec. grav. 1.414) until very nearly all the platinum is dissolved. Evaporate the solution to dryness on a water-bath, moisten the residue with a few drops of hydrochloric acid, and again evaporate to expel the excess of acid. Dissolve the residue in 20 Cc. of water. The *test-solution* may also be prepared by dissolving 1.7 Gm. of neutral platinum chloride, $\text{PtCl}_4 = 335.78$, or 2.6 Gm. of chloroplatinic acid, $\text{H}_2\text{PtCl}_6 + 3\text{H}_2\text{O} = 516.28$, in 20 Cc. of water. On evaporating a small portion of the solution to dryness and igniting the residue, pure, metallic platinum should be left behind, which should yield nothing soluble to nitric acid.

80. Potassium Carbonate Test-Solution.—Dissolve 10 Gm. of anhydrous potassium carbonate, $\text{K}_2\text{CO}_3 = 137.91$ [prepared from *Potassii Carbonas*, U. S. P.], in enough water to make 100 Cc.

81. Potassium Chromate Test-Solution.—Dissolve 1 Gm. of potassium chromate, $\text{K}_2\text{CrO}_4 = 193.9$, in enough water to make 10 Cc. On adding silver nitrate T.S. to a little of the solution, a red precipitate is produced which should be completely dissolved by nitric acid (absence of *chloride*). Another portion of the solution, mixed with an equal volume of diluted hydrochloric acid, should yield no precipitate with barium chloride T.S. (absence of *sulphate*).

82. Potassium Cyanide Test-Solution.—This should be freshly prepared, when required, by dissolving 1 Gm. of potassium cyanide, $\text{KCN} = 65.01$ [*Potassii Cyanidum*, U. S. P.], in 4 parts of water.

83. Potassium Dichromate.—Use the official potassium bichromate, $\text{K}_2\text{Cr}_2\text{O}_7 = 293.78$ [*Potassii Bichromas*].

84. Potassium Dichromate Test-Solution.—Dissolve 10 Gm. of potassium dichromate [*Potassii Bichromas*, U. S. P.] in enough water to make 100 Cc.

85. Potassium Ferricyanide Test-Solution.—Dissolve 1 part of potassium ferricyanide, $\text{K}_3\text{Fe}_2(\text{CN})_{12} = 657.7$, in about 10 parts of water. This solution should be made freshly when required, as it is rapidly decomposed by light. A freshly prepared, aqueous solution, when mixed with some ferric chloride T.S. and diluted with water, should show a brown tint, free from turbidity or a shade of green.

86. Potassium Ferrocyanide Test-Solution.—Dissolve 10 Gm. of potassium ferrocyanide, $\text{K}_4\text{Fe}(\text{CN})_6 + 3\text{H}_2\text{O} = 421.76$, in enough water to make 100 Cc.

87. Potassium Hydrate Test-Solution, $\text{KOH} = 55.99$.—Use the official solution of potassa [*Liquor Potassæ*]. For use in Fleitmann's test for arsenic (see above, No. 13), it should have previously been subjected, by itself, to this test, for at least two hours, with negative result (absence of *arsenic*).

88. Potassium Iodide Test-Solution.—Dissolve 16.556 Gm. of potassium iodide, $\text{KI} = 165.56$ [*Potassii Iodidum*, U. S. P.], in enough water to make 100 Ce., and keep the solution in dark amber-colored, well-stoppered bottles to prevent the formation of iodate. The solution should be frequently renewed, or freshly prepared when required. (This solution is of normal strength $= \frac{N}{1}$ V.S., so as to permit of its use for volumetric and gasometric purposes also.)

89. Potassium Nitrate.—The dry salt, $\text{KNO}_3 = 100.92$ [*Potassii Nitras*, U. S. P.], responding to the tests of purity required by the Pharmacopœia, particularly to those for absence of chloride and sulphate.

90. Potassium Permanganate, $\text{KMnO}_4 = 157.67$.—See below, under No. 127.

91. Potassium Sulphate Test-Solution.—Dissolve 1 Gm. of potassium sulphate, $\text{K}_2\text{SO}_4 = 173.88$ [*Potassii Sulphas*, U. S. P.], in enough water to make 115 Ce. (This solution is of decinormal strength $= \frac{N}{10}$ V.S., so as to permit of its use for volumetric purposes also, as a substitute for decinormal sulphuric acid, when it is desired not to disturb the neutrality of a liquid.)

92. Potassium Sulphocyanate Test-Solution, $\text{KSCN} = 96.99$.—Use the decinormal volumetric solution (No. 129).

93. Pyrogallol.—Use the official pyrogallol, $\text{C}_6\text{H}_3(\text{OH})_3 = 125.7$ [*Pyrogallol*].

94. Rosolic Acid.—See under *Indicators* (No. 58).

95. Silver Ammonium Nitrate Test-Solution.—Dissolve 1 Gm. of silver nitrate [*Argentii Nitras*, U. S. P.] in 20 Ce. of water, and add ammonia water, drop by drop, until the precipitate first produced is almost, but not entirely, redissolved. Filter the solution, and preserve it in dark amber-colored and well-stoppered bottles.

96. Silver Nitrate Test-Solution, $\text{AgNO}_3 = 169.55$.—For ordinary purposes, use the decinormal volumetric solution (see No. 130).

For Gutzeit's test (No. 14), use a saturated solution of silver nitrate in water acidulated with about 1 per cent. of nitric acid.

97. Silver Sulphate Test-Solution.—Dissolve 1 Gm. of silver nitrate [*Argenti Nitrates*, U. S. P.] in 0.5 Cc. of warm water, and add 1.5 Cc. of pure, concentrated sulphuric acid. On cooling, small transparent crystals of silver sulphate, $\text{Ag}_2\text{SO}_4 = 311.14$, separate. Carefully pour off the acid liquid, wash the crystals repeatedly, by decantation, with cold water, transfer them to a bottle, add 100 Cc. of water, and agitate so as to produce a saturated solution. For use, decant a sufficient quantity of the latter.

98. Sodium Acetate Test-Solution.—Dissolve 10 Gm. of sodium acetate [*Sodii Acetas*, U. S. P.] in enough water to make 100 Cc.

99. Sodium Bitartrate Test-Solution.—Dissolve 150 Gm. of tartaric acid [*Acidum Tartaricum*, U. S. P.] in 100 Cc. of hot water, and divide the solution into two equal portions. Neutralize one of these accurately with sodium bicarbonate (which will require about 84 Gm. of this salt), and then add the other portion of the acid solution. On cooling, crystals of sodium bitartrate, $\text{NaHC}_4\text{H}_4\text{O}_6 + \text{H}_2\text{O} = 189.6$, will separate. Remove these, dry them, and keep them in well-stoppered bottles. The *test-solution* is freshly prepared, when required, by dissolving 1 Gm. of the salt in 4 Cc. of water.

100. Sodium Carbonate.—The anhydrous salt, $\text{Na}_2\text{CO}_3 = 105.85$, conforming to the tests of purity prescribed by the Pharmacopœia for *Sodii Carbonas*, but absolutely free from chloride or sulphate.

101. Sodium Carbonate Test-Solution.—Dissolve 10.6 Gm. of anhydrous sodium carbonate [No. 100 ; $\text{Na}_2\text{CO}_3 = 105.85$] in enough water to make 100 Cc. (This solution is of double normal strength $= \frac{2}{N}$ V.S., so as to permit of its use for volumetric purposes also.)

102. Sodium Cobaltic Nitrite Test-Solution.— $\text{Co}_2(\text{NO}_2)_6 + 6\text{NaNO}_2 + \text{H}_2\text{O} = 824.32$. Dissolve 4 Gm. of cobaltous nitrate, $\text{Co}(\text{NO}_3)_2 + \text{H}_2\text{O} = 290.14$, and 10 Gm. of sodium nitrite, $\text{NaNO}_2 = 68.93$, in about 50 Cc. of water, add 2 Cc. of acetic acid, and dilute with enough water to make 100 Cc. Should any of the nitrous acid be lost by keeping the solution, a few drops of acetic acid may be added.

103. Sodium Hydrate Test-Solution, $\text{NaOH} = 39.96$.—Use the official solution of sodium hydrate [*Liquor Sodæ*, U. S. P.].

104. Sodium Hyposulphite, or Thiosulphate, $\text{Na}_2\text{S}_2\text{O}_3 + 5\text{H}_2\text{O} = 247.64$.—See below, under No. 133.

105. Sodium Nitrite, $\text{NaNO}_2 = 68.93$.—The purest commercial salt, generally in form of pencils, is sufficiently pure.

106. Sodium Nitroprusside Test-Solution.—Dissolve 1 part of sodium nitroprusside, $\text{Na}_2\text{Fe}(\text{NO})(\text{CN})_5 + 2\text{H}_2\text{O} = 297.67$, in 10 parts of water immediately before using.

107. Sodium Phosphate Test-Solution.—Dissolve 10 Gm. of sodium phosphate, $\text{Na}_2\text{HPO}_4 + 12\text{H}_2\text{O} = 357.32$ [*Sodii Phosphas*, U. S. P.], in enough water to make 100 Cc.

108. Stannous Chloride Test-Solution.—Heat pure tin (see No. 113), in form of foil or granules, with concentrated hydrochloric acid, taking care that the metal be in excess. When the acid is saturated, crystals of stannous chloride, $\text{SnCl}_2 + 2\text{H}_2\text{O} = 225.46$, begin to form. Remove and drain these, dissolve them in 10 parts of water, and preserve the solution in well-stoppered bottles, into each of which a granule of pure tin, or a piece of pure tin-foil, has previously been introduced.

For Bettendorff's test (see above, No. 12), pure concentrated hydrochloric acid is saturated with the freshly prepared crystals.

109. Starch Test-Solution.—Mix 1 Gm. of starch with 10 Cc. of cold water, and then add enough boiling water, under constant stirring, to make about 200 Cc. of a thin, transparent jelly. If it is desired to preserve this test-solution for any length of time, 10 Gm. of zinc chloride, $\text{ZnCl}_2 = 135.84$ [*Zinci Chloridum*, U. S. P.], should be added to it, and the solution transferred to small bottles, which should be well stoppered.

110. Sulphuric Acid, Pure, for Tests, $\text{H}_2\text{SO}_4 = 97.82$.—The sulphuric acid of the Pharmacopœia, which may have a specific gravity as low as 1.835, will answer as a reagent for most purposes, provided it is of the required degree of purity. But when "concentrated" sulphuric acid is specially directed in a test, it is intended that the strongest obtainable, pure acid, of a specific gravity of not less than 1.840, be employed.

In addition to the tests prescribed for this acid in the text of the Pharmacopœia, it is required to conform to the following more rigorous tests before it can be employed as a reagent. If 1 Cc. of diphenylamine T.S. (see No. 52) be carefully poured, as a separate layer, upon

5 Cc. of sulphuric acid, contained in a test-tube, no distinct blue color should appear in the zone of contact (absence of *nitric acid*). If a few crystals of pyrogallol [*Pyrogallol*, U. S. P.] be dissolved in about 1 Cc. of pure water, and this solution be carefully poured, as a separate layer, upon some of the sulphuric acid, contained in a test-tube, no brown color should appear in the zone of contact (absence of *nitric* or *nitrous acid*). If a small portion of the acid be subjected to Gutzeit's test, as described under No. 14, no color should be imparted to the silver nitrate within two hours (absence of *arsenic*, etc.).

If it is impossible to obtain any sulphuric acid which will comply with each of these requirements, two kinds of the acid may be kept, one absolutely free from arsenic, for making the arsenic tests; the other free from nitrose (nitric and nitrous acids), for the detection of nitric acid.

111. Tannic Acid Test-Solution.—Dissolve 1 Gm. of tannic acid, $\text{HC}_{14}\text{H}_9\text{O}_9 = 321.22$ [*Acidum Tannicum*, U. S. P.], in 1 Cc. of alcohol and enough water to make 10 Cc., immediately before use.

112. Tartaric Acid Test-Solution.—Dissolve 1 part of tartaric acid, $\text{H}_2\text{C}_4\text{H}_4\text{O}_6 = 149.64$ [*Acidum Tartaricum*, U. S. P.], in 3 parts of water. In the volumetric estimation of soda in potassa, directed by the preceding text of the Pharmacopœia, the tartaric acid test-solution employed for precipitating the potassa should contain 3 Gm. of the acid in 20 Cc. Since fungous growths rapidly destroy the solution of tartaric acid, it should be prepared only as wanted.

113. Tin.—Pure metallic tin, $\text{Sn} = 118.8$, in form of granules. Its solution in hydrochloric acid should not be precipitated by potassium sulphate T.S. (absence of *lead*), and, when examined by Gutzeit's test, as described under No. 14, it should not cause silver nitrate to become colored within two hours (absence of *arsenic*).

114. Turmeric Paper and Tincture.—See under *Indicators* (No. 59).

115. Zinc.—Metallic zinc, $\text{Zn} = 65.1$, preferably in the form of thin pencils about 5 Mm. in diameter, prepared by fusing the metal and casting it in moulds, or in form of thin sheets. It should respond to all the tests required by the text of the Pharmacopœia, and in addition, when examined by Gutzeit's test, as described under No. 14, it should not cause the silver nitrate to become colored within two hours (absence of *arsenic*).

116. **Zinc-Iodide-Starch Test-Solution.**—To 100 Cc. of freshly prepared starch test-solution (see No. 109) add 5 Gm. of zinc chloride [*Zinci Chloridum*, U. S. P.] and 3 Gm. of zinc iodide [*Zinci Iodidum*, U. S. P.]. Preserve the colorless solution carefully in small, dark amber-colored and well-stoppered vials.

III. VOLUMETRIC SOLUTIONS.

NOTE.—Since most of the volumetric instruments (burettes, pipettes, mixing cylinders, flasks, etc.) which are for sale in the market are graduated to hold the number of cubic centimeters indicated by weighing into them the corresponding number of grammes of water at the temperature of 15.556° C. (60° F.), or 15° C. (59° F.), it is necessary not to deviate materially from this temperature in making the volumetric solutions, or in using them in testing.

All measuring vessels employed for volumetric determinations should agree among themselves in accuracy of graduation.

All bottles in which volumetric solutions are to be kept, as well as the burettes or pipettes in which they are to be measured, should, prior to use, be rinsed with a small quantity of the solution they are to contain.

Volumetric solutions are designated as normal ($\frac{N}{1}$) when they contain in 1 liter the molecular weight of the active reagent, expressed in grammes, and reduced to the valency corresponding to one atom of replaceable hydrogen or its equivalent.

Thus, hydrochloric acid, $\text{HCl} = 36.37$, having but one H atom replaceable by a basic element, has 36.37 Gm. of HCl in 1000 Cc. of the normal volumetric solution; while sulphuric acid, $\text{H}_2\text{SO}_4 = 97.82$, having two replaceable H atoms, contains only one-half this number, or 48.91 grammes of H_2SO_4 in 1000 Cc. of its normal solution. Potassium hydrate, $\text{KOH} = 55.99$, has but one K to replace one H in acids, hence its normal solution contains 55.99 grammes of KOH in one liter. Two molecules of potassium permanganate, $2\text{KMnO}_4 = 315.34$, in oxidation, give off five atoms of O, which are equivalent to ten atoms of H; hence its normal solution should contain $\frac{315.34}{10}$ or 31.534 Gm. in 1 liter.

Solutions containing in 1 liter one-tenth of the quantity of the active reagent in the normal solution are called decinormal ($\frac{N}{10}$); those containing one one-hundredth, centinormal ($\frac{N}{100}$); those containing twice the amount, double-normal ($\frac{2}{N}$); half the amount, seminormal ($\frac{N}{2}$).

Solutions containing quantities of the active reagent having no simple relation to the molecular weight are called empirical.

In the following list full decimals are given, which, however (especially when delicate balances and weights are not at hand), are in practice frequently abbreviated or rounded off, as, for instance, oxalic acid : 62.85 Gm. to 63 Gm.

When weighing out portions of a substance which is to be tested volumetrically, it will, in most cases, be advantageous to weigh out such a multiple of the amount required, as will suffice for several repetitions of the test, and will, at the same time, bring the amount to be weighed out as near to a whole number of grammes as possible.

117. Alkaline Cupric Tartrate Volumetric Solution.

[FEHLING'S SOLUTION.]

A. The Copper Solution.—Dissolve 34.64 Gm. of carefully selected, small crystals of pure cupric sulphate, showing no trace of efflorescence or of adhering moisture, in a sufficient quantity of water to make the solution measure, at or near 15° C. (59° F.), exactly 500 Cc.

Keep this solution in small, well-stoppered bottles.

B. The Rochelle Salt Solution.—Dissolve 173 Gm. of potassium and sodium tartrate [*Potassii et Sodii Tartras*, U. S. P.], and 125 Gm. of potassium hydrate [*Potassa*, U. S. P.], in a sufficient quantity of water to make the solution measure, at or near 15° C. (59° F.), exactly 500 Cc.

Keep the solution in small, rubber-stoppered bottles.

For use, mix exactly equal volumes of the two solutions at the time required.

One Cubic Centimeter of the mixed solution is the equivalent of :

	Gramme.
Cupric Sulphate, crystallized, $\text{CuSO}_4 + 5\text{H}_2\text{O}$	0.03464
Cupric Tartrate, $\text{CuC}_4\text{H}_4\text{O}_6 + 3\text{H}_2\text{O}$	0.03685
Glucose, anhydrous, $\text{C}_6\text{H}_{12}\text{O}_6$	0.00500

118. Decinormal Bromine Volumetric Solution.

[KOPPESCHAAR'S SOLUTION.]

Br = 79.76. 7.976 Gm. in 1 Liter.

($\text{NaBrO}_3 = 150.64$.— $\text{NaBr} = 102.76$.)

($\text{KBrO}_3 = 166.67$.— $\text{KBr} = 118.79$.)

Dissolve 3 Gm. of sodium bromate and 50 Gm. of sodium bromide (or 3.2 Gm. of potassium bromate and 50 Gm. of potassium bromide) in enough water to make, at or near 15° C. (59° F.), 900 Cc. Of this solution transfer 20 Cc., by means of a pipette, into a bottle having a capacity of

about 250 Cc., provided with a glass stopper ; add 75 Cc. of water, next 5 Cc. of pure hydrochloric acid, and immediately insert the stopper. Shake the bottle a few times, then remove the stopper just sufficiently to quickly introduce 5 Cc. of potassium iodide T.S., taking care that no bromine vapor escape, and immediately stopper the bottle. Agitate the bottle thoroughly, remove the stopper and rinse it and the neck of the bottle with a little water so that the washings flow into the bottle, and then add from a burette decinormal sodium hyposulphite V.S. until the iodine tint is exactly discharged, using towards the end a few drops of starch T.S. as indicator. Note the number of Cc. of the sodium hyposulphite V.S. thus consumed, and then dilute the bromine solution so that equal volumes of it and of decinormal sodium hyposulphite V.S. will exactly correspond to each other under the conditions mentioned above.

EXAMPLE.—Assuming that the 20 Cc. of the bromine solution have required 25.2 Cc. of the hyposulphite to completely discharge the iodine tint, the bromine solution must be diluted in the proportion of 20 to 25.2. Thus, if 850 Cc. of it are remaining, they must be diluted with water to measure 1071 Cc.

After the solution is thus diluted, a new trial should be made in the manner above described, in which 25 Cc. of the decinormal sodium hyposulphite V.S. should exactly discharge the tint of the iodine liberated by the bromine set free from the 25 Cc. of bromine solution.

Keep the solution in dark amber-colored glass-stoppered bottles.

One Cubic Centimeter of Decinormal Bromine Solution V.S. is the equivalent of :

	Gramme.
Bromine, Br	0.007976
Carbolic Acid, C_6H_5OH	0.001563

The following article is tested with this solution :

	Gm. taken.	Cc. re- quired.	Percent. of strength indicated.
Acidum Carbolicum.	0.039	24	96 of pure phenol.

119. Normal Hydrochloric Acid.

$HCl = 36.37$. 36.37 Gm. in 1 Liter.

Mix 130 Cc. of hydrochloric acid of specific gravity 1.163 with enough water to make it measure, at or near $15^{\circ} C$. ($59^{\circ} F$.), 1000 Cc.

Of this liquid (which is still too concentrated) carefully measure 10 Cc. into a flask, add a few drops of phenolphthalein T.S., and gradually add, from a burette, potassium hydrate V.S., until the red tint produced by it no longer disappears on vigorous shaking, but is not

deeper than pale pink. Note the number of Cc. of potassium hydrate V.S. consumed, and then dilute the acid solution so that equal volumes of this and of the potassium hydrate V.S. neutralize each other.

EXAMPLE.—Assuming that 10 Cc. of the acid solution first prepared required exactly 11 Cc. of potassium hydrate V.S., each 10 Cc. of the former must be diluted to 11 Cc., or the whole of the remaining acid solution in the same proportion. Thus, if 950 Cc. are remaining, 95 Cc. of water must be added.

After the liquid is thus diluted, a new trial should be made in the manner above described, in which 50 Cc. of the acid solution should require for neutralization exactly 50 Cc. of potassium hydrate V.S. If necessary, a new adjustment should then be made to render the correspondence perfect.

One Cubic Centimeter of Normal Hydrochloric Acid is the equivalent of:

Gramme.

Hydrochloric Acid, absolute, HCl 0.03637

NOTE.—Normal hydrochloric acid is in every respect equivalent in neutralizing power to normal sulphuric acid (see below, No. 134), and may be employed, if more convenient, for the same purposes.

120. Decinormal Iodine Volumetric Solution.

$I = 126.53.$ 12.653 Gm.* in 1 Liter.

Dissolve 12.653 Gm.* of pure iodine (see below) in a solution of 18 Gm. of pure potassium iodide in 300 Cc. of water. Then add enough water to make the solution measure, at or near 15° C. (59° F.), exactly 1000 Cc.

Transfer the solution to small, glass-stoppered vials, which should be kept in a dark place.

Preparation of Pure Iodine.—Heat powdered iodine in a porcelain dish placed over a boiling water-bath, and stir it constantly with a glass rod, so that the adhering moisture, together with any cyanogen iodide and most of the iodine bromide and chloride that may be present, may be vaporized. After twenty minutes transfer the iodine to a porcelain or other non-metallic mortar, and triturate it with about 5 per cent. of its weight of pure, dry potassium iodide, so as to decompose any remaining iodine bromide and chloride. Then return the

* Instead of taking 12.653 Gm., this figure is often rounded off to 12.65, or even to 12.7. But, whenever a delicate balance is available, the exact amount above directed should be taken.

mass to the dish, cover it with a clean glass funnel, and heat the dish on a sand-bath. Detach the sublimed, pure iodine, and keep it in well-stoppered bottles, in a cool place.

One Cubic Centimeter of Decinormal Iodine V.S. is the equivalent of:

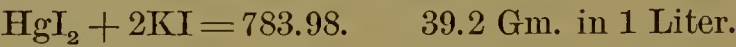
	Gramme.
Iodine, I.....	0.012653
Arsenic Trioxide (arsenous acid), As_2O_3	0.004942
Potassium Sulphite, crystallized, $\text{K}_2\text{SO}_3 + 2\text{H}_2\text{O}$	0.009692
Sodium Bisulphite, NaHSO_3	0.005193
Sodium Hyposulphite (Thiosulphate), crystals, $\text{Na}_2\text{S}_2\text{O}_3$ + $5\text{H}_2\text{O}$	0.024764
Sodium Sulphite, crystallized, $\text{Na}_2\text{SO}_3 + 7\text{H}_2\text{O}$	0.012579
Sulphur Dioxide, SO_2	0.003195
Antimony and Potassium Tartrate, cryst., $2\text{K}(\text{SbO})\text{C}_4\text{H}_4\text{O}_6$ + H_2O	0.016560

The following articles are tested with this solution:

	Gm. taken.	Cc. re- quired.	Percent. of strength indicated.
Acidum Arsenosum.....	0.1	20.0	98.8 of As_2O_3 .
Acidum Sulphurosum.....	2.0	40.0	6.4 of SO_2 .
Antimonii et Potassii Tartras (cryst.)..	0.331	20.0	100 of pure salt.
Liquor Acidi Arsenosi	24.7 Cc.	49.4 to 50	1 of As_2O_3 .
Liquor Potassii Arsenitis	24.7 Cc.	49.4 to 50	1 of As_2O_3 .
Sodii Bisulphis.....	0.26	45.0	90 of pure salt.
Sodii Hyposulphis	0.25	9.9	98.1 of cryst. salt.
Sodii Sulphis	0.63	48.0	96 of cryst. salt.

121. Decinormal Mercuric Potassium Iodide Volumetric Solution.

[MAYER'S SOLUTION.]



Dissolve 13.546 Gm. of pure mercuric chloride in 600 Cc. of water, and 49.8 Gm. of pure potassium iodide in 100 Cc. of water. Mix the two solutions, and then add enough water to make the mixture measure, at or near 15° C. (59° F.), exactly 1000 Cc.

One Cubic Centimeter of Decinormal Mercuric Potassium Iodide V.S. is the equivalent of:

	Gramme.
Mercuric Potassium Iodide, $\text{HgI}_2 + 2\text{KI}$	0.0392

122. Normal Oxalic Acid Volumetric Solution.



Dissolve 62.85 Gm.* of pure oxalic acid (see below) in enough water to make, at or near 15° C. (59° F.), exactly 1000 Cc.

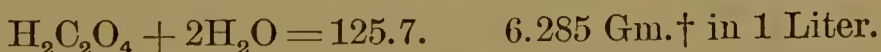
Pure Oxalic Acid, crystallized, is in form of colorless, transparent, clinorhombic crystals which, on ignition upon platinum-foil, leave no residue. One part of it is completely soluble in 14 parts of water at 15° C. (59° F.). Oxalic acid which leaves a residue on ignition, or on solution in water, must be purified, which may be done as follows: To 1 part of the acid add 10 parts of cold water, and shake until the latter is saturated. Filter off the solution from the undissolved crystals, evaporate the filtrate to about three-fourths of its volume, and set it aside so that the fixed salts which it contains may crystallize out. Carefully decant the liquid from the crystals, concentrate it by evaporation, and set it aside to crystallize, stirring occasionally to prevent the formation of large crystals which might enclose moisture. Drain the crystals in a funnel, dry them carefully on blotting paper, and preserve them in well-stoppered bottles.

NOTE.—Normal oxalic acid volumetric solution is in every respect equivalent in neutralizing power to *normal sulphuric acid* (No. 134), or *normal hydrochloric acid* (No. 119), and may be employed, if more convenient, for the same purposes. The solution, however, has a tendency to crystallize at the point of the burette.

One Cubic Centimeter of Normal Oxalic Acid V.S. is the equivalent of:

	Gramme.
Oxalic Acid, crystallized, $\text{H}_2\text{C}_2\text{O}_4 + 2\text{H}_2\text{O}$	0.06285
Ammonia Gas, NH_3	0.01701
Sodium Hydrate, NaOH	0.03996
Potassium Hydrate, KOH	0.05599
Potassium Permanganate, KMnO_4	0.03153

123. Decinormal Oxalic Acid Volumetric Solution.



Dissolve 6.285 Gm.† of pure oxalic acid (see under No. 122) in enough water to make, at or near 15° C. (59° F.), exactly 1000 Cc.

* This is frequently rounded off to 63 Gm. when a delicate balance and exact weights are not at hand.

† Generally rounded off to 6.3 Gm., when a delicate balance and exact weights are not available.

One Cubic Centimeter of Decinormal Oxalic Acid V.S. is the equivalent of:

	Gramme.
Oxalic Acid, crystallized, $\text{H}_2\text{C}_2\text{O}_4 + 2\text{H}_2\text{O}$	0.006285
Ammonia Gas, NH_3	0.001701
Calcium Hydrate, $\text{Ca}(\text{OH})_2$	0.003691
Potassium Hydrate, KOH	0.005599
Potassium Permanganate, KMnO_4	0.0031534
Sodium Hydrate, NaOH	0.003996

The following articles are tested with this solution:

	Gm. taken.	Cc. re- quired.	Percent. of strength indicated.
Liquor Calcis.....	50.0	★20.0	★0.14 of $\text{Ca}(\text{OH})_2$.
Potassii Iodidum (alkalinity, K_2CO_3) ..	1.0	0.05	0.034 of alkali.
Potassii Permanganas.....	0.1	31.3	98.70 of pure salt.

124. Decinormal Potassium Dichromate Volumetric Solution.

$\text{K}_2\text{Cr}_2\text{O}_7 = 293.78$. 4.896 Gm.* in 1 Liter.

Dissolve 4.896 Gm.* of pure potassium dichromate (see below) in enough water to make, at or near 15°C . (59°F .), exactly 1000 Cc.

Pure Potassium Dichromate for use in volumetric analysis, besides responding to the tests given in the text of the Pharmacopœia (under *Potassii Bichromas*), must conform to the following tests. In a solution of 0.5 Gm. of the salt in 10 Cc. of water rendered acid by 0.5 Cc. of nitric acid, no visible change should be produced either by barium chloride T.S. (absence of *sulphate*), or by silver nitrate T.S. (absence of *chloride*). In a mixture of 10 Cc. of the aqueous solution (1 in 20) with 1 Cc. of ammonia water, no precipitate should be produced by ammonium oxalate T.S. (absence of *calcium*).

When used with phenolphthalein as indicator, to neutralize alkalies, the volumetric solution of potassium dichromate is decinormal when it contains 14.689 Gm. in 1 liter. It is then the exact equivalent of any decinormal acid, corresponding to the amounts of alkalies quoted, for instance, under Decinormal Oxalic Acid V.S. (No. 123).

When used as an oxidizing agent to convert ferrous into ferric salts, or to liberate iodine from potassium iodide, the solution just mentioned (containing 14.689 Gm. in 1 liter) has the effect of a $\frac{3\text{N}}{10}$ volumetric solution, and a solution of one-third of this strength, containing 4.896 Gm. in 1 liter, has the value of a decinormal solution, and is the equivalent of equal volumes of decinormal potassium permanganate V.S., or, in the case of iodine liberated from potassium iodide, it is

* Generally rounded off to 4.9 Gm., when a delicate balance and exact weights are not available.

the equivalent of equal volumes of decinormal sodium hyposulphite V.S. For titrating iron in *ferrous* compounds, it is used in the following manner. Introduce the aqueous solution of the ferrous salt into a flask and, if it is not already acid, render it so with sulphuric acid. Now add, gradually, decinormal potassium dichromate V.S. from a burette, until a drop taken out upon a white surface no longer shows a blue color with a drop of freshly prepared potassium ferricyanide T.S.

Decinormal potassium dichromate V.S. may also be used, in conjunction with potassium iodide (from which it liberates iodine) and sulphuric acid, for adjusting the titer of sodium hyposulphite (thio-sulphate) V.S. and, by its means, that of the iodine V.S.

One Cubic Centimeter of Decinormal Potassium Dichromate V.S. is the equivalent of:

	Gramme.
Potassium Dichromate, $K_2Cr_2O_7$	0.0048963
Iron, in ferrous compounds	0.005588
Ferrous Carbonate, $FeCO_3$	0.011573
Ferrous Sulphate, anhydrous, $FeSO_4$	0.015170
Ferrous Sulphate, crystallized, $FeSO_4 + 7H_2O$	0.027742
Ferrous Sulphate, dried, $2FeSO_4 + 3H_2O$	0.017864
Potassium Hydrate, KOH	0.001866
Sodium Hyposulphite (Thiosulphate), $Na_2S_2O_3 + 5H_2O$..	0.024764

The following articles may be tested with this solution:

	Gm. taken.	Cc. re- quired.	Percent. of strength indicated.
Ferri Carbonas Saccharatus.....	1.16	★15	★ 15 of iron.
Ferri Sulphas.....	1.3871	50	100 of pure salt.
Ferri Sulphas Granulatus.....	1.3871	50	100 of pure salt.

125. Normal Potassium Hydrate Volumetric Solution.

KOH = 55.99. 55.99 Gm.* in 1 Liter.

Dissolve 75 Gm. of potassium hydrate [*Potassa*, U. S. P.] in enough water to make, at or near 15° C. (59° F.), about 1050 Cc., and fill a burette with a portion of this liquid.

Put 0.6285 Gm.† of pure oxalic acid (see No. 122) into a flask of the capacity of about 100 Cc., and dissolve it with about 10 Cc. of water. Add a few drops of phenolphthalein T.S., and then carefully add, from the burette, the potassium hydrate solution, frequently

* This figure is frequently rounded off to 56 Gm.

† This figure may be rounded off to 0.63 Gm., if a delicate balance and exact weights are not available.

agitating the flask, and regulating the flow to drops towards the end of the operation, until the red color produced by its influx no longer disappears on shaking, but is not deeper than pale pink. Note the number of Ce. of the potassium hydrate solution consumed, and then dilute the remainder of the solution so that exactly 10 Ce. of the diluted liquid shall be required to neutralize 0.6285 Gm.* of oxalic acid.

EXAMPLE.—Assuming that 8.0 Ce. of the stronger solution of potassium hydrate first prepared had been consumed in the trial, then each 8.0 Ce. must be diluted to 10 Ce., or the whole of the remaining solution in the same proportion. Thus, if 1000 Ce. should be still remaining, this must be diluted with water to 1250 Ce.

After the liquid is thus diluted, a new trial should be made in the manner above described, in which 10 Ce. of the diluted solution should exactly neutralize 0.6285 Gm.* of oxalic acid. If necessary, a new adjustment should then be made to render the correspondence perfect.

NOTE.—Solutions of caustic alkalies are very prone to absorb carbon dioxide from the atmosphere, and thereby become liable to occasion errors when used with litmus T.S. or phenolphthalein T.S. as indicator (methyl-orange T.S. is not affected by the presence of carbonic acid). Hence the volumetric solutions should be preserved in small vials provided with well-fitting corks or rubber stoppers, or, better still, they should have tubes filled with a mixture of soda and lime attached to their stoppers, so as to absorb the carbon dioxide and prevent its access to the solution.

In place of potassium hydrate V.S., sodium hydrate V.S. (see No. 132) may be used, in the same manner and in the same quantity. Potassium hydrate V.S., however, is preferable, since it foams less, and attacks glass more slowly and less energetically.

One Cubic Centimeter of Normal Potassium Hydrate V.S. is the equivalent of:

	Gramme.
Potassium Hydrate, KOH.....	0.05599
Sodium Hydrate, NaOH.....	0.03996
Ammonia Gas, NH ₃	0.01701
Ammonium Chloride, NH ₄ Cl.....	0.05338
Acetic Acid, absolute, HC ₂ H ₃ O ₂	0.05986
Citric Acid, crystallized, H ₃ C ₆ H ₅ O ₇ + H ₂ O.....	0.06983
Hydrobromic Acid, absolute, HBr.....	0.08076

* This figure may be rounded off to 0.63 Gm., if a delicate balance and exact weights are not available.

	Gramme.
Hydrochloric Acid, absolute, HCl	0.03637
Hydriodic Acid, absolute, HI	0.12753
Hypophosphorous Acid, HPH_2O_2	0.06588
Lactic Acid, absolute, $\text{HC}_3\text{H}_5\text{O}_3$	0.08979
Nitric Acid, absolute, HNO_3	0.06289
Oxalic Acid, crystallized, $\text{H}_2\text{C}_2\text{O}_4 + 2\text{H}_2\text{O}$	0.06285
Phosphoric Acid, H_3PO_4 (to form K_2HPO_4 ; with phenolphthalein)	0.0489
Phosphoric Acid, H_3PO_4 (to form KH_2PO_4 ; with methyl-orange)	0.0978
Potassium Dichromate, $\text{K}_2\text{Cr}_2\text{O}_7$	0.14689
Sulphuric Acid, absolute, H_2SO_4	0.04891
Tartaric Acid, crystallized, $\text{H}_2\text{C}_4\text{H}_4\text{O}_6$	0.07482

The following articles are tested with this solution :

	Gm. taken.	Cc. re- quired.		Percent. of strength indicated.
Acidum Aceticum	6.0	36.0	36	of absolute acid.
Acidum Aceticum Dilutum	24.0	24.0	6	of absolute acid.
Acidum Aceticum Glaciale	3.0	49.5	99	of absolute acid.
Acidum Citricum	3.5	50.0	100	of crystall. acid.
Acidum Hydrobromicum Dilutum	8.08	10.0	10	of absolute acid.
Acidum Hydrochloricum	3.64	31.9	31.9	of absolute acid.
Acidum Hydrochloricum Dilutum	3.64	10.0	10	of absolute acid.
Acidum Hypophosphorosum Dilutum.	6.6	★10.0	★10	of absolute acid.
Acidum Lacticum	4.50	37.5	75	of absolute acid.
Acidum Nitricum	3.145	34.0	68	of absolute acid.
Acidum Nitricum Dilutum	6.29	10.0	10	of absolute acid.
Acidum Phosphoricum	0.978	17.0	85	of absolute acid.
Acidum Phosphoricum Dilutum	4.89	10.0	10	of absolute acid.
Acidum Sulphuricum	0.49	9.25	92.5	of absolute acid.
Acidum Sulphuricum Aromaticum	4.89	★18.5	★18.5	of absolute acid.
Acidum Sulphuricum Dilutum	4.89	10.0	10	of absolute acid.
Acidum Tartaricum	3.75	50.0	100	of crystall. acid.
Vinum Album	50.0	3.0	0.45	} of acid assumed to be tartaric.
Vinum Rubrum		to	to	
		5.2	0.78	

126. Centinormal Potassium Hydrate Volumetric Solution.

$\text{KOH} = 55.99.$ 0.5599 Gm. in 1 Liter.

Dilute 10 Cc. of normal potassium hydrate volumetric solution with enough distilled water to make 1000 Cc.

One Cubic Centimeter of Centinormal Potassium Hydrate V.S. is the equivalent of:

	Gramme.
Potassium Hydrate, KOH	0.0005599
Sulphuric Acid, H ₂ SO ₄	0.0004891
Combined Alkaloids of Nux Vomica*	0.00364

127. Decinormal Potassium Permanganate Volumetric Solution.

$2\text{KMnO}_4 = 315.34.$ 3.1534 Gm.† in 1 Liter.

I. Place 3.5 Gm. of pure, crystallized potassium permanganate in a flask, add 1000 Cc. of boiling water, and boil until the crystals are dissolved. Close the flask, and set it aside for two days, so that any suspended matters may deposit. This is the *stronger solution*. Prepare another, *weaker solution*, in the same manner, using 6.6 Gm. of the salt and 2200 Cc. of water, and set this also aside for two days. After the lapse of this time, pour off the clear portion of each solution into separate vessels provided with glass stoppers, and then proceed to test each separately.

Introduce into a flask 10 Cc. of decinormal oxalic acid V.S., add 1 Cc. of pure, concentrated sulphuric acid, and, before this mixture cools, gradually add from a burette small quantities of the weaker permanganate solution, shaking the flask after each addition and reducing the flow to drops towards the end of the operation. When the last drop of the permanganate solution added is no longer decolorized but imparts a pinkish tint to the liquid, note the number of Cc. consumed. In the same manner ascertain the titer of the stronger solution, and likewise note down the number of Cc. of the latter consumed. Finally mix the two solutions in such proportions that 50 Cc. of the mixture will exactly correspond to an equal volume of decinormal oxalic acid V.S.

NOTE.—To obtain the accurate proportions for mixing the two solutions, deduct 10 from the number of Cc. of the weaker solution required to decompose 10 Cc. of decinormal oxalic acid V.S. With this difference multiply the number of Cc. of the stronger solution required

* Assumed to consist of equal parts of strychnine and brucine.—Centinormal potassium hydrate V.S. (in place of which centinormal sodium hydrate V.S., prepared in the same manner, may be employed) is used in the assay of Extract of Nux Vomica, to neutralize the excess of decinormal sulphuric acid employed.

† This quantity is never directly weighed, but adjusted either by Oxalic Acid or by Iron; in calculations it is often abbreviated.

for the same purpose. The product shows the number of Cc. of the *stronger solution* needed for the mixture.

Next deduct the number of Cc. of the stronger solution required to decompose 10 Cc. of decinormal oxalic acid V.S. from 10, and with the difference multiply the number of Cc. of the weaker solution required for the same purpose. The product shows the number of Cc. of the *weaker solution* needed for the mixture.

Or, designating by S the number of Cc. of the stronger solution, and by W the number of Cc. of the weaker solution required to decompose 10 Cc. of decinormal oxalic acid V.S., the following formula will give the proportions in which the solutions must be mixed :

Stronger Solution : Weaker Solution :

$$(W - 10) S \quad + \quad (10 - S) W$$

EXAMPLE.—Assuming that 9 Cc. of the stronger (S) and 10.5 of the weaker (W) solution had been required, then, substituting these values in the above given formula, we obtain :

$$(10.5 - 10) 9 + (10 - 9) 10.5$$

$$\text{or, } 4.5 \quad \quad + \text{ or, } 10.5$$

making 15 Cc. of final solution.

The bulk of the two solutions is now mixed in the same proportion, 450 Cc. of the stronger and 1050 Cc. of the weaker, or 900 Cc. of the stronger and 2100 Cc. of the weaker solution.

After the mixture is thus prepared, a new trial should be made, when 10 Cc. of the solution should exactly decompose 10 Cc. of the decinormal oxalic acid V.S. If necessary, a new adjustment should be made to render the correspondence perfect.

This solution should be kept in small, dark amber-colored and glass-stoppered bottles (or in bottles provided with tubes, especially designed for the purpose). Thus prepared, this solution will hold its titer for months ; yet it should be tested occasionally, and, when it is found reduced, the liquid should be brought back to normal strength by the addition of such an amount of the stronger solution as may be determined in the manner above described.

II. When potassium permanganate V.S. is to be prepared for immediate use, this may be done in the following manner. Dissolve 3.5 Gm. of pure, crystallized potassium permanganate in 1000 Cc. of pure water, recently boiled and cooled. Introduce 10 Cc. of decinormal oxalic acid V.S. into a beaker, add 1 Cc. of pure concentrated sulphuric acid, and proceed as directed above for the weaker permanganate solution. Note the number of Cc. of the solution consumed, and then dilute the remainder with pure water recently boiled and cooled, until 50 Cc. will exactly correspond to 50 Cc. of decinormal oxalic acid V.S.

EXAMPLE.—Assuming that 9.1 Cc. of the permanganate solution first prepared had been required to produce a permanent pink tint, then every 9.1 Cc. of the solution must be diluted to 10 Cc., or the whole of the remaining solution in the same proportion. A new trial should then be made to verify the agreement.

NOTE.—Potassium permanganate V.S. thus prepared is liable to deteriorate more readily and quickly than that prepared by the method first given (under I.). It cannot be safely trusted without verification, each time it is to be used.

One Cubic Centimeter of Decinormal Potassium Permanganate V.S. is the equivalent of:

	Gramme.
Potassium Permanganate, KMnO_4	0.0031534
Barium Dioxide, BaO_2	0.008441
Calcium Hypophosphite, $\text{Ca}(\text{PH}_2\text{O}_2)_2$	0.0021209
Ferrie Hypophosphite, $\text{Fe}_2(\text{PH}_2\text{O}_2)_6$	0.0020877
Iron, in ferrous compounds, Fe	0.005588
Ferrous Carbonate, FeCO_3	0.011573
Ferrous Oxide, FeO	0.007195
Ferrous Sulphate, anhydrous, FeSO_4	0.015170
Ferrous Sulphate, crystals, $\text{FeSO}_4 + 7\text{H}_2\text{O}$	0.027742
Ferrous Sulphate, dried, $2\text{FeSO}_4 + 3\text{H}_2\text{O}$	0.017864
Hydrogen Dioxide, H_2O_2	0.001696
Hypophosphorous Acid, HPH_2O_2	0.001647
Oxalic Acid, crystallized, $\text{H}_2\text{C}_2\text{O}_4 + 2\text{H}_2\text{O}$	0.006285
Oxygen, O	0.000798
Potassium Hypophosphite, KPH_2O_2	0.002598
Sodium Hypophosphite, $\text{NaPH}_2\text{O}_2 + \text{H}_2\text{O}$	0.002646

The following articles are tested with this solution:

	Gm. taken.	Cc. re- quired.	Percent. of strength indicated.
Acidum Hypophosphorosum Dilutum	0.5	★30.3	★10 of absolute acid.
Aqua Hydrogenii Dioxidii	1.7 Cc.	★30.0	★ 3 of H_2O_2 .
Barii Dioxidum	0.422	40.0	80 of pure BaO_2 .
Calcii Hypophosphis	0.1	47.0	99.68 of pure salt.
Ferri Carbonas Saccharatus	1.16	★15.0	★15 of FeCO_3 .
Ferri Hypophosphis	0.1	47.0	98.1 of pure salt.
Ferri Sulphas	1.39	50.0	100 of pure salt.
Ferri Sulphas Granulatus	1.39	50.0	100 of pure salt.
Ferrum Reductum	0.056	8.0	80 of iron as metal.
Potassii Hypophosphis	0.1	38.0	98.7 of pure salt.
Sodii Hypophosphis	0.1	37.0	97.9 of pure salt.

128. Centinormal Potassium Permanganate Volumetric Solution.

$$2\text{KMnO}_4 = 315.34. \quad 0.31534 \text{ Gm. in 1 Liter.}$$

Dilute 10 Cc. of the decinormal potassium permanganate V.S., after having ascertained that it possesses its exact titer, with enough distilled water strictly complying with the tests given in the text of the Pharmacopœia for *Aqua Destillata*, to make 100 Cc.

This solution should be freshly made when required.

One Cubic Centimeter of Centinormal Potassium Permanganate V.S. is the equivalent of:

	Gramme.
Potassium Permanganate, KMnO_4	0.00031534
Oxalic Acid, crystallized, $\text{H}_2\text{C}_2\text{O}_4 + 2\text{H}_2\text{O}$	0.0006285
Oxygen (derived from the permanganate) available for oxidation	0.0000798

129. Decinormal Potassium Sulphocyanate Volumetric Solution.

[VOLHARD'S SOLUTION.]

$$\text{KSCN} = 96.99. \quad 9.699 \text{ Gm. in 1 Liter.}$$

Dissolve 10 Gm. of crystals of pure potassium sulphocyanate in 1000 Cc. of water.

This solution is yet too concentrated, and has to be adjusted so as to correspond in strength exactly with decinormal silver nitrate V.S. For this purpose, introduce into a flask 10 Cc. of decinormal silver nitrate V.S. together with 0.5 Cc. of ferric ammonium sulphate T.S. and 5 Cc. of diluted nitric acid. To this mixture add, from a burette, in small portions at a time, the sulphocyanate solution. At first a white preeipitate of silver sulphocyanate appears, then every drop falling from the burette is surrounded by a deep brownish-red color of ferric sulphocyanate which disappears on vigorous shaking of the flask as long as any of the silver nitrate remains unchanged. When all the silver has been converted into sulphocyanate, a single additional drop of the potassium sulphocyanate solution produces a brownish-red color which no longer disappears on shaking, but communicates a perceptible pale brownish or reddish tint to the contents of the flask. Note the number of Cc. of the potassium sulphocyanate solution used, and dilute the whole of the remaining solution so that equal volumes of this and of the decinormal silver nitrate V.S. will

be required to produce the permanent brownish or reddish tint. (The same depth of pale brownish or reddish tint to which the volumetric solution is adjusted must be attained when the solution is used for volumetric assays.)

After the dilution, a new trial should be made, in which 50 Cc. of decinormal silver nitrate V.S., 2.5 Cc. of ferric ammonium sulphate T.S., and 25 Cc. of diluted nitric acid are used, and there should be required exactly 50 Cc. of the sulphocyanate solution to produce the same depth of a permanent pale brownish or reddish tint.

If necessary, a new adjustment should be made, to render the correspondence perfect.

One Cubic Centimeter of Decinormal Potassium Sulphocyanate V.S. is the equivalent of :

	Gramme.
Potassium Sulphocyanate, KSCN	0.009699
Silver, Ag.	0.010766
Silver Nitrate, AgNO ₃	0.016955

The following articles are tested with this solution :

Ferri Iodidum Saccharatum.	} Determined by residual titration with decinormal silver nitrate V.S., and decinormal potassium sulphocyanate V.S.
Syrupus Ferri Iodidi.	

130. Decinormal Silver Nitrate Volumetric Solution.

AgNO₃ = 169.55. 16.955 Gm.* in 1 Liter.

Dissolve 16.955 Gm.* of pure silver nitrate in enough water to make, at or near 15° C. (59° F.), exactly 1000 Cc.

Keep the solution in small, dark amber-colored, glass-stoppered vials, carefully protected from dust.

NOTE.—Titration by decinormal silver nitrate V.S. may be managed in various ways, adapted to the special preparation to be tested :

a. In most cases it is directed by the U. S. P. to be used in presence of a small quantity of potassium chromate T.S., which serves to indicate the end of the reaction by the appearance of the red color of silver chromate.

b. In some cases (potassium cyanide, hydrocyanic acid) it is added until the first appearance of a permanent precipitate.

* Frequently rounded off to 16.96 Gm., when a delicate balance and exact weights are not available.

c. It may be used in *all* cases without indicator by observing the exact point when no further precipitate occurs. This may be practised in the case of ferrous iodide, where the addition of potassium chromate would be improper, but it consumes much time in waiting for the precipitate to subside so as to render the liquid sufficiently clear to recognize whether a further precipitate is produced by addition of the silver solution.

d. It may be added in definite amount, known to be in excess of the quantity required, and the excess of the decinormal silver solution measured back by the addition of decinormal potassium sulphocyanate V.S. (residual titration).

One Cubic Centimeter of Decinormal Silver Nitrate V.S. is the equivalent of:

	Gramme.
Silver Nitrate, AgNO_3	0.016955
Ammonium Bromide, NH_4Br	0.009777
Ammonium Chloride, NH_4Cl	0.005338
Calcium Bromide, CaBr_2	0.0099715
Ferrous Bromide, FeBr_2	0.010770
Ferrous Iodide, FeI_2	0.015447
Hydrocyanic Acid, absolute, HCN , with indicator	0.002698
Hydrocyanic Acid, absolute, HCN , to first formation of precipitate.....	0.005396
Hydriodic Acid, HI	0.012753
Hydrobromic Acid, HBr	0.008076
Lithium Bromide, LiBr	0.008677
Potassium Bromide, KBr	0.011879
Potassium Chloride, KCl	0.007440
Potassium Cyanide, KCN , with indicator.....	0.006501
Potassium Cyanide, KCN , to first formation of precipitate	0.013002
Potassium Iodide, KI	0.016556
Potassium Sulphocyanate, KSCN	0.009699
Sodium Bromide, NaBr	0.010276
Sodium Chloride, NaCl	0.005837
Sodium Iodide, NaI	0.014953
Strontium Bromide, SrBr_2 (anhydrous)	0.012341
Strontium Iodide, SrI_2 (anhydrous)	0.017018
Zinc Bromide, ZnBr_2	0.011231
Zinc Chloride, ZnCl_2	0.006792
Zinc Iodide, ZnI_2	0.015908

The following articles are tested with this solution :

	Gm. taken.	Cc. re- quired.	Percent. of strength indicated.
Acidum Hydrocyanicum Dilutum...	1.35	10.0	2 of absolute acid.
Ammonii Bromidum.....	0.3	30.9	99 of pure salt.
Calcii Bromidum	0.25	25.0	99.7 of pure salt.
† Ferri Iodidum Saccharatum	1.55	★20.0	★20 of iodide.
Lithii Bromidum	0.3	35.3	98 of pure salt.
Potassii Bromidum	0.5	42.85	97 of pure salt.
Potassii Cyanidum (to first precip.) .	0.65	45.0	90 of pure salt.
Potassii Iodidum	0.5	30.25	99.5 of pure salt.
Sodii Bromidum.....	0.3	29.8	97.29 of pure salt.
Sodii Chloridum.....	0.195	33.4	99.9 of pure salt.
Sodii Iodidum.....	0.5	{ 34.5 to 33.4 }	★98 of pure salt.
Strontii Bromidum (dry).....	0.3	24.6	98 of pure salt.
Strontii Iodidum (dry).....	0.3	18.0	98 of pure salt.
Syrupus Acidi Hydriodici.....	32.0	★25.0	★ 1 of III.
† Syrupus Ferri Iodidi	1.55	★10.0	★10 of FeI ₂ .
Zinci Bromidum.....	0.3	26.7	99.95 of pure salt.
Zinci Chloridum.....	0.3	44.1	99.84 of pure salt.
Zinci Iodidum.....	0.5	31.0	98.62 of pure salt.

NOTE.—The articles marked with † are determined by residual titration with decinormal silver nitrate V.S. and decinormal potassium sulphocyanate V.S.

131. Decinormal Sodium Chloride Volumetric Solution.

NaCl = 58.37. 5.837 Gm.* in 1 Liter.

Dissolve 5.837 Gm.* of pure sodium chloride (see below) in enough water to make, at or near 15° C. (59° F.), exactly 1000 Cc.

Pure Sodium Chloride may be prepared by passing a current of dry hydrochloric acid gas into a saturated aqueous solution of the purest commercial sodium chloride, separating the crystalline precipitate, and drying it at a temperature sufficiently high to expel all traces of free acid.

In place of this, transparent crystals of pure rock-salt may be employed.

One Cubic Centimeter of Decinormal Sodium Chloride V.S. is the equivalent of :

	Gramme.
Sodium Chloride, NaCl	0.005837
Silver, Ag.....	0.010766
Silver Nitrate, AgNO ₃	0.016955
Silver Oxide, Ag ₂ O.....	0.011564

* Frequently rounded off to 5.84 Gm., when a delicate balance and exact weights are not available.

The following articles are tested with this solution :

	Gm. taken.	Cc. re- quired.	Percent. of strength indicated.
Argenti Nitras.....	0.34	20.0	100 of silver nitrate.
Argenti Nitras Dilutus.....	1.0	19.5	33.14 of silver nitrate.
Argenti Nitras Fusus	0.34	19.0	95 of silver nitrate.

132. Normal Sodium Hydrate Volumetric Solution.

$\text{NaOH} = 39.96.$ 39.96 Gm.* in 1 Liter.

Dissolve 54 Gm. of sodium hydrate (*Soda*, U. S. P.) in enough water to make, at or near 15°C . (59°F .), about 1050 Cc., and fill a burette with a portion of this liquid.

Put 0.6285 Gm.† of pure oxalic acid (see under No. 122) into a flask of the capacity of about 100 Cc., and dissolve it with about 10 Cc. of water. Add a few drops of phenolphthalein T.S., and then carefully add, from the burette, the sodium hydrate solution, frequently agitating the flask, and regulating the flow to drops towards the end of the operation, until the red color produced by its influx no longer disappears on shaking, but is not deeper than pale pink. Note the number of Cc. of the sodium hydrate solution consumed, and then dilute the remainder of it so that exactly 10 Cc. of the diluted liquid will be required to neutralize 0.6285 Gm.† of oxalic acid.

EXAMPLE.—Assuming that 7.8 Cc. of the stronger solution of sodium hydrate first prepared had been consumed in the trial, then each 7.8 Cc. must be diluted to 10 Cc., or the whole of the remaining solution in the same proportion. Thus, if 980 Cc. should be still remaining, this must be diluted with water to 1258 Cc.

After the liquid is thus diluted, a new trial should be made in the manner above described, in which 10 Cc. of the diluted solution should exactly neutralize 0.6285 Gm. of oxalic acid. If necessary, a new adjustment should then be made, to render the correspondence perfect.

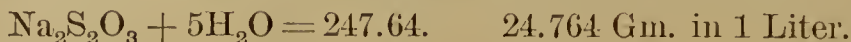
NOTE.—The same precautions should be taken for protecting this solution from the carbon dioxide of the air, as are prescribed for normal potassium hydrate V.S. (see No. 125).

This solution may be employed in place of the normal potassium hydrate V.S., volume for volume.

* Frequently rounded off to 40 Gm.

† This may be rounded off to 0.63 Gm., when a delicate balance and exact weights are not available.

133. Decinormal Sodium Hyposulphite Volumetric Solution.



Dissolve 30 Gm. of selected crystals of sodium hyposulphite (sodium thiosulphate) in enough water to make, at or near 15° C. (59° F.), 1100 Cc. Of this solution transfer 10 Cc. into a flask, add a few drops of starch T.S., and then gradually add, from a burette, decinormal iodine V.S., in small portions at a time, shaking the flask after each addition, and regulating the flow to drops towards the end of the operation. As soon as the color produced by the influx of the iodine solution no longer disappears on shaking, but is not deeper than very pale blue, note the number of Cc. of the iodine solution consumed. Then dilute the sodium hyposulphite solution so that equal volumes of it and of decinormal iodine V.S. will exactly correspond to each other under the conditions mentioned above.

EXAMPLE.—Assuming that 10 Cc. of the stronger sodium hyposulphite solution first prepared had required 10.7 Cc. of decinormal iodine V.S. to produce a faint reaction with starch, the hyposulphite solution must be diluted in the proportion of 10 Cc. to 10.7 Cc., or 1000 Cc. to 1070 Cc.

After the solution is thus diluted, a new trial should be made in the manner above described, in which 50 Cc. of the decinormal sodium hyposulphite V.S. should require exactly 50 Cc. of decinormal iodine V.S. to produce a faint reaction with starch. If necessary, a new adjustment should then be made to render the correspondence perfect.

Keep the solution in small, dark amber-colored, glass-stoppered bottles, carefully protected from dust.

NOTE.—When this solution is to be used, fill a burette with it, place the liquid to be tested either for the free iodine it already contains, or for that which it liberates from an excess of potassium iodide added to it, into a flask, and gradually add small portions of the solution from the burette, shaking after each addition, and regulating the flow to drops towards the end of the operation, until the brown color of the iodine has nearly disappeared. Now add a few drops of starch T.S., which will produce a blue color, and then continue to add the hyposulphite solution in drops until the blue tint is exactly discharged.

One Cubic Centimeter of Decinormal Sodium Hyposulphite V.S. is the equivalent of:

	Gramme.
Sodium Hyposulphite (Thiosulphate), $\text{Na}_2\text{S}_2\text{O}_3 + 5\text{H}_2\text{O} \dots$	0.024764
Bromine, Br	0.007976
Chlorine, Cl	0.003537

	Gramme.
Iodine, I	0.012653
Iron, Fe, in ferric salts	0.005588

The following articles are tested with this solution :

	Gm. taken.	Cc. re- quired.	Percent. of strength indicated.
Aqua Chlori	17.7	20.0	0.4 of chlorine.
Calx Chlorata	0.354	35.0	35 of chlorine.
Ferri Chloridum	0.56	20.0	20 of iron.
Ferri Citras	0.56	★16.0	★16 of iron.
Ferri et Ammonii Citras	0.56	★16.0	★16 of iron.
Ferri et Ammonii Sulphas	0.56	11.6	11.6 of iron.
Ferri et Ammonii Tartras	0.56	★17.0	★17 of iron.
Ferri et Potassii Tartras	0.56	★15.0	★15 of iron.
Ferri et Quininæ Citras	0.56	★14.5	★14.5 of iron.
Ferri et Quininæ Citras Solubilis..	0.56	★14.5	★14.5 of iron.
Ferri et Strychninæ Citras	0.56	★16.0	★16 of iron.
Ferri Phosphas Solubilis	0.56	★12.0	★12 of iron.
Ferri Pyrophosphas Solubilis.....	0.56	★10.0	★10 of iron.
Ferri Valerianas	0.56	15.0 to 20.0	15 to 20 of iron.
Ferrum Reductum.....	0.056	8.0	80 of iron.
Iodum	0.32	25.0	98.85 of iodine.
Liquor Ferri Acetatis	1.12	★15.0	★ 7.5 of iron.
Liquor Ferri Chloridi	1.12	★26.0	★13 of iron.
Liquor Ferri Citratis	1.12	★15.0	★ 7.5 of iron.
Liquor Ferri Nitratis	1.12	★ 2.8	★ 1.4 of iron.
Liquor Ferri Subsulphatis.....	1.12	★27.2	★13.6 of iron.
Liquor Ferri Tersulphatis	1.12	★16.0	★ 8 of iron.
Liquor Iodi Compositus.....	12.66	49.3 to 50.	5 of iodine.
Liquor Sodæ Chloratæ	6.7	50.0	2.6 of chlorine.
Tinctura Ferri Chloridi	1.12	★ 9.4	★ 4.7 of iron.
Tinctura Iodi.....	6.3 Cc.	★35.0	★ 7 Gm. of I in 100 Cc.

134. Normal Sulphuric Acid.

$\text{H}_2\text{SO}_4 = 97.82.$ 48.91 Gm. in 1 Liter.

Carefully mix 30 Cc. of pure, concentrated sulphuric acid (of specific gravity 1.835) with enough water to make about 1050 Cc., and allow the liquid to cool to about 15° C. (59° F.). Place 10 Cc. of this liquid (which is yet too concentrated) into a flask, add a few drops of phenolphthalein T.S., and afterwards, from a burette, normal potassium hydrate V.S., shaking after each addition, and regulating the flow to drops towards the end of the operation, until the red color produced by its influx no longer disappears on shaking, but is not deeper than pale pink. Note the number of Cc. of potassium hydrate consumed. Then dilute the sulphuric acid solution so that equal volumes of this and of normal potassium hydrate V.S. exactly neutralize each other.

EXAMPLE.—Assuming that 10 Cc. of the acid solution first prepared had required exactly 11.2 Cc. of normal potassium hydrate V.S., each 10 Cc. of the former must be diluted to 11.2 Cc., or each 1000 Cc. to 1120 Cc.

After the liquid is thus diluted, a new trial should be made in the manner above described, in which 50 Cc. of the acid solution should require for neutralization exactly 50 Cc. of potassium hydrate V.S. If necessary, a new adjustment should be made to render the correspondence perfect.

NOTE.—It is recommended that, in alkalimetric determinations, when an acid of normal strength is required, normal sulphuric acid be employed, in place of normal oxalic acid V.S. (see note under No. 122).

One Cubic Centimeter of Normal Sulphuric Acid is the equivalent of :

	Gramme.
Sulphuric Acid, absolute, H_2SO_4	0.04891
Ammonia Gas, NH_3	0.01701
Ammonium Carbonate, $(\text{NH}_4)_2\text{CO}_3$	0.047935
Ammonium Carbonate [U.S.P.], $\text{NH}_4\text{HCO}_3 \cdot \text{NH}_4\text{NH}_2\text{CO}_2$..	0.05226
Lead Acetate, crystallized, $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2 + 3\text{H}_2\text{O}$	0.18900
Lead Subacetate, assumed as $\text{Pb}_2\text{O}(\text{C}_2\text{H}_3\text{O}_2)_2$	0.13662
Lithium Benzoate, $\text{LiC}_7\text{H}_5\text{O}_2$ (to be ignited)	0.12772
Lithium Carbonate, Li_2CO_3	0.036935
Lithium Citrate, $\text{Li}_3\text{C}_6\text{H}_5\text{O}_7$ (to be ignited)	0.0698566
Lithium Salicylate, $\text{LiC}_7\text{H}_5\text{O}_3$ (to be ignited)	0.14368
Potassium Acetate, $\text{KC}_2\text{H}_3\text{O}_2$ (to be ignited)	0.09789
Potassium Bicarbonate, KHCO_3	0.09988
Potassium Bitartrate, $\text{KHC}_4\text{H}_4\text{O}_6$ (to be ignited)	0.18767
Potassium Carbonate, anhydrous, K_2CO_3	0.068955
Potassium Citrate, cryst., $\text{K}_3\text{C}_6\text{H}_5\text{O}_7 + \text{H}_2\text{O}$ (to be ignited)	0.10786
Potassium Hydrate, KOH	0.05599
Potassium and Sodium Tartrate, $\text{KNaC}_4\text{H}_4\text{O}_6 + 4\text{H}_2\text{O}$ (to be ignited)	0.14075
Sodium Acetate, $\text{NaC}_2\text{H}_3\text{O}_2 + 3\text{H}_2\text{O}$ (to be ignited)	0.13574
Sodium Benzoate, $\text{NaC}_7\text{H}_5\text{O}_2$ (to be ignited)	0.14371
Sodium Bicarbonate, NaHCO_3	0.08385
Sodium Borate, crystallized, $\text{Na}_2\text{B}_4\text{O}_7 + 10\text{H}_2\text{O}$	0.19046
Sodium Carbonate, anhydrous, Na_2CO_3	0.052925
Sodium Carbonate, crystallized, $\text{Na}_2\text{CO}_3 + 10\text{H}_2\text{O}$	0.142725
Sodium Hydrate, NaOH	0.03996
Strontium Lactate, $\text{Sr}(\text{C}_3\text{H}_5\text{O}_3)_2$ (to be ignited)	0.13244

The following articles are tested with this solution :

	Gm. taken.	Cc. re- quired.	Percent. of strength indicated.
Ammonii Carbonas.....	2.613	50.0	100 of pure salt.
Aqua Ammoniae.....	3.4	20.0	10 of dry gas.
Aqua Ammoniae Fortior	1.7	28.0	28 of dry gas.
Liquor Plumbi Subacetatis	13.67	★25.0	★25 of basic salt.
Liquor Potassae.....	28.00	25.0	5 of hydrate.
Liquor Sodae	20.00	25.0	5 of hydrate.
Lithii Benzoas (to be ignited)	1.0	7.8	99.6 of pure salt.
Lithii Carbonas	0.5	13.4	98.98 of pure salt.
Lithii Citras (to be ignited)	1.0	14.2	99.2 of pure salt.
Lithii Salicylas (to be ignited).....	2.0	13.8	99.13 of pure salt.
Potassa	0.56	9.0	90 of hydrate.
Potassii Acetas (to be ignited)	1.0	10.0	98 of pure salt.
Potassii Bicarbonas	1.0	10.0	100 of pure salt.
Potassii Bitartras (to be ignited).....	1.88	9.9	99 of pure salt.
Potassii Carbonas	0.69	9.5	95 of anhyd. salt.
Potassii Citras (to be ignited).....	1.08	10.0	100 of crystall. salt.
Potassii et Sodii Tartras (to be ignited).	1.41	10.0	100 of pure salt.
Soda.....	0.4	9.0	90 of hydrate.
Sodii Acetas (to be ignited).....	1.36	10.0	100 of pure salt.
Sodii Benzoas (to be ignited)	2.0	13.9	99.8 of pure salt.
Sodii Bicarbonas	0.85	10.0	98.6 of pure salt.
Sodii Carbonas, anhydrous.....	1.0	18.7	98.9 of anhyd. salt.
Sodii Carbonas Exsiccatus	1.0	13.8	★73 of anhyd. salt.
Spiritus Ammoniae.....	3.4	20.0	10 of ammonia.
Strontii Lactas (to be ignited)	1.33	9.9	98.6 of pure salt.

135. Decinormal Sulphuric Acid.

$\text{H}_2\text{SO}_4 = 97.82.$ 4.891 Gm. in 1 Liter.

Dilute 10 Cc. of normal sulphuric acid with enough water to make 100 Cc.

One Cubic Centimeter of Decinormal Sulphuric Acid is the equivalent of :

Gramme.

Sulphuric Acid, absolute, H_2SO_4 0.004891

Combined Alkaloids of Nux Vomica, assumed to consist of
equal parts of Strychnine and Brucine 0.0364

Potassium Hydrate, KOH..... 0.005599

The following article is tested with this solution :

	Gm. taken.	Cc. re- quired.	Percent. of strength required.
Extractum Nucis Vomicae	0.4	*1.65	15 of total alkaloids.

* To be determined to at least 2 decimals by titrating the uncombined acid with centinormal potassium hydrate V.S.

ALPHABETICAL LIST OF VOLUMETRIC ASSAYS DIRECTED BY THE U. S. PHARMACOPŒIA.

Name.	Gm. taken.	Cc. re- quired.	Volumetric Solution.	Indicator.	Percentage of Strength.
Acidum Aceticum	6.0	36.0	Normal KOH	Phenolphthalein	36 of abs. acid.
Acidum Aceticum Dilutum	24.0	24.0	Normal KOH	Phenolphthalein	6 of abs. acid.
Acidum Aceticum Glaciale	3.0	49.5	Normal KOH	Phenolphthalein	99 of abs. acid.
Acidum Arsenosum	0.1	20.0	DeciN. Iodine	Starch	98.8 of As_2O_3 .
Acidum Carbolium	0.039	24.0	DeciN. Bromine*		96 of pure phenol.
Acidum Citricum	3.5	50.0	Normal KOH	Phenolphthalein	100 of pure acid.
Acidum Hydrobromicum Dilut.	8.08	10.0	Normal KOH	Phenolphthalein	10 of abs. acid.
Acidum Hydrochloricum	3.64	31.9	Normal KOH	Phenolphthalein	31.9 of abs. acid.
Acidum Hydrochloricum Dilut.	3.64	10.0	Normal KOH	Phenolphthalein	10 of abs. acid.
Acidum Hydrocyanicum Dilut..	1.35	10.0	DeciN. $AgNO_3$	K_2CrO_4	2 of abs. acid.
Acidum Hypophosphorosum Dil.	{ 0.5 6.6 }	{ 30.3 10.0 }	DeciN. $KMnO_4$		{ 10 of abs. acid. 10 of abs. acid.
Acidum Lacticum	4.5	37.5	Normal KOH	Phenolphthalein	75 of abs. acid.
Acidum Nitricum	3.145	34.0	Normal KOH	Phenolphthalein	68 of abs. acid.
Acidum Nitricum Dilutum	6.29	10.0	Normal KOH	Phenolphthalein	10 of abs. acid.
Acidum Phosphoricum	{ 0.978 0.978 }	{ 17.0 8.5 }	Normal KOH	Phenolphthalein	85 of abs. acid.
Acidum Phosphoricum Dilutum	{ 4.89 4.89 }	{ 10.0 5.0 }	Normal KOH	Methyl-Orange	85 of abs. acid.
Acidum Sulphuricum	0.489	9.25	Normal KOH	Phenolphthalein	10 of abs. acid.
Acidum Sulphuricum Aromati- cum	{ 4.89 4.89 }	{ 18.5 10.0 }	Normal KOH	Methyl-Orange	10 of abs. acid.
Acidum Sulphuricum Dilutum.	4.89	10.0	Normal KOH	Phenolphthalein	92.5 of abs. acid.
Acidum Sulphuricum Dilutum.	4.89	10.0	Normal KOH	Phenolphthalein	10 of abs. acid.

* Determined by residual titration with decinormal sodium hyposulphite V.S.

Acidum Sulphurosus	2.0	40.0	DeciN. Iodine	Starch	6.4	of SO ₂ .
Acidum Tartaricum	3.75	50.0	Normal KOH	Phenolphthalein	100	of pure acid.
Ammonii Bromidum	0.3	30.9	DeciN. AgNO ₃	K ₂ CrO ₄	99	of NH ₄ Br.
Ammonii Carbonas	2.613	50.0	Normal H ₂ SO ₄	Rosolic Acid	100	of pure salt.
Antimonii et Potassii Tartras	0.331	20.0	DeciN. Iodine	Starch	100	of pure salt.
Aqua Ammoniae	3.4	20.0	Normal H ₂ SO ₄	Rosolic Acid	10	of NH ₃ .
Aqua Ammoniae Fortior	1.7	28.0	Normal H ₂ SO ₄	Rosolic Acid	28	of NH ₃ .
Aqua Chlori	17.7	20.0	DeciN. Na ₂ S ₂ O ₃	Starch	0.4	of chlorine.
Aqua Hydrogenii Dioxidum	1.7 Cc.	30.0	DeciN. KMnO ₄		3	of H ₂ O ₂ .
Argentum Nitras	0.34	20.0	DeciN. NaCl	K ₂ CrO ₄	99.97	of AgNO ₃ .
Argentum Nitras Dilutus	1.0	19.5	DeciN. NaCl	K ₂ CrO ₄	33.14	of AgNO ₃ .
Argentum Nitras Fusus	0.34	19.0	DeciN. NaCl	K ₂ CrO ₄	95	of AgNO ₃ .
Barium Dioxidum	0.422	40.0	DeciN. KMnO ₄		80	of pure BaO ₂ .
Calcium Bromidum	0.25	25.0	DeciN. AgNO ₃	K ₂ CrO ₄	99.7	of pure salt.
Calcium Hypophosphis	0.1	47.0	DeciN. KMnO ₄		99.68	of pure salt.
Calx Chlorata	0.354	35.0	DeciN. Na ₂ S ₂ O ₃	Starch	35	of chlorine.
Extractum Nucis Vomicae	0.4	1.65	DeciN. H ₂ SO ₄	Phenolphthalein	15	of total alkaloids.
Ferri Carbonas Saccharatus	3.47	★15.0	DeciN. K ₂ Cr ₂ O ₇	Ferricyanide	★15	of FeCO ₃ .
Ferri Carbonas Saccharatus	1.16	★15.0	DeciN. KMnO ₄		★15	of FeCO ₃ .
Ferri Chloridum	0.56	20.0	DeciN. Na ₂ S ₂ O ₃	Starch	20	of iron.
Ferri Citras	0.56	★16.0	DeciN. Na ₂ S ₂ O ₃	Starch	★16	of iron.
Ferri et Ammonii Citras	0.56	★16.0	DeciN. Na ₂ S ₂ O ₃	Starch	★16	of iron.
Ferri et Ammonii Sulphas	0.56	11.6	DeciN. Na ₂ S ₂ O ₃	Starch	11.6	of iron.
Ferri et Ammonii Tartras	0.56	★17.0	DeciN. Na ₂ S ₂ O ₃	Starch	★17	of iron.
Ferri et Potassii Tartras	0.56	★15.0	DeciN. Na ₂ S ₂ O ₃	Starch	★15	of iron.
Ferri et Quininae Citras	0.56	★14.5	DeciN. Na ₂ S ₂ O ₃	Starch	★14.5	of iron.
Ferri et Quininae Citras Solubilis	0.56	★14.5	DeciN. Na ₂ S ₂ O ₃	Starch	★14.5	of iron.
Ferri et Strychninae Citras	0.56	★16.0	DeciN. Na ₂ S ₂ O ₃	Starch	★16	of iron.

Alphabetical List of Volumetric Assays directed by the U. S. Pharmacopœia.—*Continued.*

Name.	Gm. taken.	Cc. re- quired.	Volumetric Solution.	Indicator.	Percentage of Strength.
Ferri Hypophosphis.....	0.1	47.0	DeciN. KMnO_4		98.1 of pure salt.
Ferri Iodidum Saccharatum....	1.55	★20.0	DeciN. AgNO_3^*		★20 of FeI_2 .
Ferri Phosphas Solubilis.....	0.56	★12.0	DeciN. $\text{Na}_2\text{S}_2\text{O}_3$	Starch	★12 of iron.
Ferri Pyrophosphas Solubilis...	0.56	★10.0	DeciN. $\text{Na}_2\text{S}_2\text{O}_3$	Starch	★10 of iron.
Ferri Sulphas (cryst. and gran.)	1.39	50.0	DeciN. KMnO_4		100 of pure crystals.
Ferri Valerianas	0.56	$\left\{ \begin{array}{l} 15.0 \\ \text{to } 20.0 \end{array} \right\}$	DeciN. $\text{Na}_2\text{S}_2\text{O}_3$	Starch	15 to 20 of iron.
Ferrum Reductum	0.056	8.0	DeciN. KMnO_4		80 of iron.
Ferrum Reductum	0.056	8.0	DeciN. $\text{Na}_2\text{S}_2\text{O}_3$	Starch	80 of iron.
Iodum	0.32	25.0	DeciN. $\text{Na}_2\text{S}_2\text{O}_3$	Starch	98.85 of iodine.
Liquor Acidi Arsenosi.....	24.7 Cc.	$\left\{ \begin{array}{l} 49.4 \\ \text{to } 50. \end{array} \right\}$	DeciN. Iodine	Starch	1 Gm. of As_2O_3 in 100 Cc.
Liquor Calcis	50.0	★20.0	DeciN. $\text{H}_2\text{C}_2\text{O}_4$	Phenolphthalein	★ 0.14 of $\text{Ca}(\text{OH})_2$.
Liquor Ferri Acetatis	1.12	★15.0	DeciN. $\text{Na}_2\text{S}_2\text{O}_3$	Starch	★ 7.5 of iron.
Liquor Ferri Chloridi	1.12	★26.0	DeciN. $\text{Na}_2\text{S}_2\text{O}_3$	Starch	★13 of iron.
Liquor Ferri Citratis	1.12	★15.0	DeciN. $\text{Na}_2\text{S}_2\text{O}_3$	Starch	★ 7.5 of iron.
Liquor Ferri Nitratis	1.12	★ 2.8	DeciN. $\text{Na}_2\text{S}_2\text{O}_3$	Starch	★ 1.4 of iron.
Liquor Ferri Subsulphtis	1.12	★27.2	DeciN. $\text{Na}_2\text{S}_2\text{O}_3$	Starch	★13.6 of iron.
Liquor Ferri Tersulphtis.....	1.12	★16.0	DeciN. $\text{Na}_2\text{S}_2\text{O}_3$	Starch	★ 8 of iron.
Liquor Iodi Compositus.....	12.66	$\left\{ \begin{array}{l} 49.3 \\ \text{to } 50. \end{array} \right\}$	DeciN. $\text{Na}_2\text{S}_2\text{O}_3$	Starch	5 of iodine.
Liquor Plumbi Subacetatis.....	13.67	★25.0	Normal H_2SO_4	Methyl-Orange	★25 of basic salt.
Liquor Potassæ	28.0	★25.0	Normal H_2SO_4	Phenolphthalein	★ 5 of KOH .

* Determined by residual titration with decinormal potassium sulphocyanate V.S., ferric ammonium sulphate T.S. being used as indicator.

Liquor Potassii Arsenitis	24.7 Cc.	$\left\{ \begin{array}{l} 49.4 \\ \text{to } 50. \end{array} \right\}$	DeciN. Iodine	Starch	1 Gm. of As_2O_3 in 100 Cc.
Liquor Sodæ	20.0	★25.0	Normal H_2SO_4	Phenolphthalein	★5 of NaOH.
Liquor Sodæ Chloratæ	6.7	50.0	DeciN. $\text{Na}_2\text{S}_2\text{O}_3$	Starch	2.6 of chlorine.
Lithii Benzoas (to be ignited) . .	1.0	7.8	Normal H_2SO_4	Methyl-Orange	99.6 of pure salt.
Lithii Bromidum	0.3	35.3	DeciN. AgNO_3	K_2CrO_4	98 of pure salt.
Lithii Carbonas	0.5	13.4	Normal H_2SO_4	Methyl-Orange	98.98 of pure salt.
Lithii Citras (to be ignited)	1.0	14.2	Normal H_2SO_4	Methyl-Orange	99.2 of pure salt.
Lithii Salicylas (to be ignited) . .	2.0	13.8	Normal H_2SO_4	Methyl-Orange	99.13 of pure salt.
Potassa	0.56	9.0	Normal H_2SO_4	Phenolphthalein	90 of KOH.
Potassii Acetas (to be ignited) . .	1.0	10.0	Normal H_2SO_4	Methyl-Orange	98 of pure salt.
Potassii Bicarbonas	1.0	10.0	Normal H_2SO_4	Methyl-Orange	100 of pure salt.
Potassii Bitartras (to be ignited)	1.88	9.9	Normal H_2SO_4	Methyl-Orange	99 of pure salt.
Potassii Bromidum	0.5	42.85	DeciN. AgNO_3	K_2CrO_4	97 of pure salt.
Potassii Carbonas	0.69	9.5	Normal H_2SO_4	Methyl-Orange	95 of pure salt.
Potassii Citras (to be ignited) . . .	1.08	10.0	Normal H_2SO_4	Methyl-Orange	100 of pure salt.
Potassii Cyanidum	0.65	45.0	DeciN. AgNO_3	To first Prec'te	90 of pure salt.
Potassii et Sodii Tartras (to be ignited)	1.41	10.0	Normal H_2SO_4	Methyl-Orange	100 of pure salt.
Potassii Hypophosphis	0.1	38.0	DeciN. KMnO_4		98.7 of pure salt.
Potassii Iodidum	0.5	30.25	DeciN. AgNO_4	K_2CrO_4	99.5 of pure salt.
Potassii Iodidum (alkal., K_2CO_3)	1.0	0.05	DeciN. $\text{H}_2\text{C}_2\text{O}_4$	Phenolphthalein	0.034 of alkali.
Potassii Permanganas	0.1	31.3	DeciN. $\text{H}_2\text{C}_2\text{O}_4$		98.7 of KMnO_4 .
Soda	0.4	9.0	Normal H_2SO_4	Phenolphthalein	90 of NaOH.
Sodii Acetas (to be ignited)	1.36	10.0	Normal H_2SO_4	Methyl-Orange	100 of pure salt.
Sodii Benzoas (to be ignited)	2.0	13.9	Normal H_2SO_4	Methyl-Orange	99.8 of pure salt.
Sodii Bicarbonas	0.85	10.0	Normal H_2SO_4	Methyl-Orange	98.6 of pure salt.
Sodii Bisulphis	0.26	45.0	DeciN. Iodine	Starch	90 of pure salt.

Alphabetical List of Volumetric Assays directed by the U. S. Pharmacopœia.—*Continued.*

Name.	Gm. taken.	Cc. re- quired.	Volumetric Solution.	Indicator.	Percentage of Strength.
Sodii Bromidum	0.3	29.8	DeciN. AgNO ₃	K ₂ CrO ₄	97.29 of pure salt.
Sodii Carbonas, anhydrous	1.0	18.7	Normal H ₂ SO ₄	Methyl-Orange	98.9 of pure salt.
Sodii Carbonas Exsiccatus	1.0	13.8	Normal H ₂ SO ₄	Methyl-Orange	★73 of dry salt.
Sodii Chloridum	0.195	33.4	DeciN. AgNO ₃	K ₂ CrO ₄	99.9 of pure salt.
Sodii Hypophosphis	0.1	37.0	DeciN. KMnO ₄		97.9 of pure salt.
Sodii Hyposulphis	0.25	9.9	DeciN. Iodine	Starch	98.1 of pure salt.
Sodii Iodidum	0.5	$\left\{ \begin{array}{l} 34.5 \\ \text{to} \\ 33.4 \end{array} \right\}$	DeciN. AgNO ₃	K ₂ CrO ₄	★98 of pure salt.
Sodii Sulphis	0.63	48.0	DeciN. Iodine	Starch	96 of pure salt.
Spiritus Ammoniae	3.4	20.0	Normal H ₂ SO ₄	Rosolic Acid	10 of NH ₃ .
Strontii Bromidum	0.3	24.6	DeciN. AgNO ₃	K ₂ Cr ₂ O ₇	★98 of pure salt.
Strontii Iodidum	0.3	18.0	DeciN. AgNO ₃	K ₂ Cr ₂ O ₇	★98 of pure salt.
Strontii Lactas (to be ignited) ..	1.33	9.9	Normal H ₂ SO ₄	Methyl-Orange	98.6 of pure salt.
Syrupus Acidi Hydriodici	32.0	★25.0	DeciN. AgNO ₃	K ₂ CrO ₄	★1 of HI.
Syrupus Ferri Iodidi	1.55	★10.0	DeciN. AgNO ₃ *		★10 of FeI ₂ .
Tinctura Ferri Chloridi	1.12	★	DeciN. Na ₂ S ₂ O ₃	Starch	★4.7 of iron.
Tinctura Iodi	6.3 Cc.	★35.0	DeciN. Na ₂ S ₂ O ₃	Starch	★7 Gm. of I in 100 Cc.
Vinum Album	50.0	$\left\{ \begin{array}{l} 3. \text{ to} \\ 5.2 \end{array} \right\}$	Normal KOH	Phenolphthalein	0.45 to 0.78 of acid.
Vinum Rubrum	50.0	$\left\{ \begin{array}{l} 3. \text{ to} \\ 5.2 \end{array} \right\}$	Normal KOH	$\left\{ \begin{array}{l} \text{Eosin, or} \\ \text{Fluorescein} \end{array} \right\}$	0.45 to 0.78 of acid.
Zinci Bromidum	0.3	26.7	DeciN. AgNO ₃	K ₂ CrO ₄	99.95 of pure salt.
Zinci Chloridum	0.3	44.1	DeciN. AgNO ₃	K ₂ CrO ₄	99.84 of pure salt.
Zinci Iodidum	0.5	31.0	DeciN. AgNO ₃	K ₂ CrO ₄	98.62 of pure salt.

* Determined by residual titration with decinormal silver nitrate V.S. and decinormal potassium sulphocyanate V.S., ferric ammonium sulphate T.S. being used as indicator.

IV. GASOMETRIC ESTIMATIONS.

In certain cases the Pharmacopœia directs the strength of a product or chemical substance to be determined by the volume of some gas (nitrogen dioxide) given off during a definite reaction. This volume is to be determined by the nitrometer in the following manner.

Arrange a nitrometer consisting of a measuring tube (graduated for at least 50 Cc.) and connected by stout rubber tubing with an open equilibrium tube (both tubes, preferably, provided with a globular expansion near the lower end) in such a manner, by suitable clamps attached to a stand, that either tube may be readily and quickly clamped at a higher or lower level. The stop-cock of the measuring tube having been opened, and the open equilibrium tube having been raised to a higher level, pour into the latter a saturated aqueous solution of sodium chloride, until the measuring tube, including the bore of the stop-cock, is completely filled. Then close the latter and fix the equilibrium tube at a low level. Having ascertained that the stop-cock is closed air-tight, and having, if necessary, wiped out the graduated funnel tube of the nitrometer, introduce into it the prescribed quantity of the liquid to be tested, and allow this to flow slowly into the measuring tube, being careful not to admit any air. Follow it by the prescribed quantities of the several reagents (potassium iodide T.S., and normal sulphuric acid). When the reaction, which takes place at once, moderates, remove the measuring tube from its clamp, and, being careful to hold it constantly so that the liquid contained in it stands at a higher level than that in the equilibrium tube, shake its contents, without permitting any gas to pass into the open tube. When the reaction has completely ceased, restore the tube to its fastening, and allow the apparatus and contents to acquire the ordinary temperature of the room, which is assumed to be at or about 25° C. (77° F.). Then adjust the two tubes so that the liquid columns are at exactly the same level, and read off the volume of gas in the measuring tube. Multiply this figure by the weight of the substance yielding 1 Cc. of nitrogen dioxide (see below). The result will be the weight of the pure substance (nitrite) contained in the amount taken for the assay.

For pharmacopœial purposes the determination will be sufficiently exact if the evolved gas be measured at or near 25° C. (77° F.). If it be desired to ascertain the volume which the gas would occupy at

The following articles are tested gasometrically by the volume of Nitrogen Dioxide evolved and measured at or near 25° C. (77° F.):

	Amount taken.	Volume of NO.	Strength indicated.
Amyl Nitris.....	0.26 Gm.*	★40 Cc.	★80% of pure amyl nitrite.
Sodii Nitris.....	0.15 “	50 Cc.	97.6% of pure salt.
Spiritus Ætheris Nitrosi (fresh)..<	5 Cc.	55 Cc.	★ 4% of pure ethyl nitrite.

V. ALKALOIDAL ASSAY BY IMMISCIBLE SOLVENTS.

It is a property of many alkaloids that they are soluble in certain liquids in which their salts are insoluble, while in other liquids the case is reversed. When such liquids are not miscible, the conditions are favorable to what has been called the “shaking-out” process of separation. In many cases the extraction or separation may be effected by shaking together the concentrated aqueous extract, to which a suitable alkaline precipitant has been added, and some solvent, such as chloroform, ether, benzin, benzol, amyl alcohol, etc. The precipitated alkaloid is thus washed out of the aqueous solution, and is dissolved by the chloroform or other immiscible liquid employed. From the solution of the alkaloid thus obtained, the latter may again be abstracted by a dilute acid. In this Pharmacopœia the only liquid which is directed as solvent for alkaloids in such assays is *chloroform*. The extraction is directed to be performed in a glass separator or separatory funnel, which consists of an elongated (globular, cylindrical, or conical) glass vessel, provided with a well-fitting stopper and an outlet-tube containing a well-ground glass stop-cock.

When the solution of an alkaloid, suitably prepared, is introduced into this vessel, and chloroform subsequently added, the latter, owing to its higher specific gravity, will form the lower layer. If the two layers are violently shaken together, there will often result an emulsion, which will separate only slowly; and often imperfectly. This is particularly liable to happen when the aqueous liquid containing the alkaloid either in suspension or in solution is strongly alkaline, and when it has a high specific gravity. To avoid the formation of an emulsion, the extraction should be accomplished rather by rapid rotation and frequent inversion of the separator than by violent shaking. When an emulsion has formed, its separation may be promoted by the

* This quantity will, theoretically, yield a little more than 40 Cc. of the gas; but there will be a slight loss, as the gas is somewhat soluble in the liquid.

addition of more of the solvent, preferably somewhat heated, aided, if necessary, by the external application of a gentle heat (the stopper being removed for the time being), or by the introduction of a small quantity of alcohol or of hot water. The separation of the two layers may also be promoted by stirring the lower, chloroformic layer with a glass rod and detaching from the walls of the separator the adhering drops of emulsion.

On withdrawing the chloroform solution of an alkaloid from the separator, a small amount of the solution will generally be retained in the outlet-tube by capillary attraction. If this were lost, the results of the assay would be seriously vitiated. To avoid this loss, several successive, small portions of chloroform should be poured into the separator without agitation, and drawn off through the stop-cock to wash out the outlet-tube.

Another source of loss is the pressure sometimes generated in the separator by the rise of temperature caused when an alkaline and an acid liquid are shaken together. On loosening the stopper, the liquid which adheres to the juncture of the latter with the neck is liable to be ejected. This is best avoided by mixing the liquids at first by rotation (avoiding contact of the contents with the stopper), and allowing them to become cold before stoppering the separator.

The same precautions should be observed when an alkali carbonate has been used, in place of a caustic alkali, for setting free the alkaloid. In this case the liquids should be cautiously and gradually mixed by rotation, and the separator should be left unstoppered until gas is no longer given off.

If a regular glass separator is not available, an ordinary burette, stoppered with a sound cork, may be employed in its place. In this case the quantities of the alkaloidal solution and of the volatile solvent must be adjusted to the size of the burette.

VI. DETERMINATION OF THE OPTICAL ROTATION OF ORGANIC SUBSTANCES.

Many organic substances either liquid by nature or in solution in suitable solvents, when examined in a specially constructed polarizing apparatus or polaristrobometer, exhibit the property of circular polarization, or, in other words, are capable of rotating the plane of polarization of a ray of light either to the right or to the left. Such substances are termed "optically active," and when rotating to the right

are designated as "dextro-rotatory" or "dextrogyrate," and when rotating to the left, as "lævo-rotatory" or "lævogyrate." Substances which do not possess this property of optical rotation are termed "optically inactive."

Among the substances recognized by this Pharmacopœia, there are several, particularly certain essential or volatile oils, and related bodies, for which the determination of the angle of rotation of a ray of polarized light, or, in some cases, the proof of their optical inactivity, affords the most simple and positive evidence of their identity or purity.

The instruments used for this purpose vary somewhat in their construction. Those which are most generally adapted for the examination of the substances mentioned above are the Polaristrobometer of Wild, in which the optical activity of the substance is manifested by the appearance or disappearance of dark, parallel stripes, or the so-called "half-shadow" instrument of Laurent, in which the two sides of the field of vision are capable of becoming unequally illuminated. Both of the instruments permit the angle of rotation to be read off in degrees or fractions of a degree of a circle.

These optical determinations are best made in a dark room, and by means of homogeneous or monochromatic light, the latter being obtained by introducing into a non-luminous flame, on a loop of platinum wire, a small bead of fused sodium chloride. The light thus radiated corresponds with the line D of the solar spectrum.

Since the deviation of the plane of polarization either to the right or to the left of the zero point is directly proportional to the length of the column of liquid, it is important that the observations should be made with tubes of a definite length, such as 100, 50, or 25 Mm. The selection of the length of the tube to be employed is, however, usually dependent upon the depth of color of the liquid and the extent of its optical rotation.

The rotatory power of an optically active, liquid substance, observed with sodium light, and referred to the ideal density 1, and in a tube having a length of 1 decimeter (100 Mm.), is designated as its *specific rotatory power*. This is usually expressed by the term $[\alpha]_D$. Since, however, not only the density of an optically active liquid, but also its rotation, is influenced by the temperature, the specific rotation varies with the latter. In stating the specific rotation it is, therefore, necessary to indicate at what temperature the rotation and the density of the liquid have been determined. But for the same temperature the specific rotation of a pure, optically active liquid is always a constant number.

For calculating the specific rotatory power of an optically active liquid substance, or solution of an optically active solid, the following formulas are of general application :

$$\begin{array}{ll} \text{I. For liquid substances} & [\alpha]_D = \frac{100 \times a}{L \times d} \\ \text{II. For solutions of solids} & \left\{ \begin{array}{l} [\alpha]_D = \frac{10000 \times a}{L \times p \times d} \\ \text{or} \quad [\alpha]_D = \frac{10000 \times a}{L \times c} \end{array} \right. \end{array}$$

For calculating these formulas the determination of the following factors is necessary :

- a = the angle of rotation of the liquid or solid observed with sodium light.
 L = the length of the tube in millimeters.
 d = the density or specific gravity of the active liquid.
 p = the amount of active substance in 100 parts by weight of the solution.
 c = the number of grammes of active substance in 100 cubic centimeters of the solution.

LIST OF THE PRINCIPAL PHARMACOPŒIAL CHEMICALS AND REAGENTS.

NOTE.—This list contains all the official chemicals and reagents of a definite composition, and also a few which are not official, but are likely to be required in stoichiometrical calculations. Aniline coloring matters and compounds of uncertain composition have been omitted. The elementary substances are given in a separate list (see page 524). In the case of a few salts, for which the Pharmacopœia has given no formula on account of the difficulty of securing an absolutely uniform composition, the theoretical formula has been inserted merely for information. And in the case of most hydrated compounds the formula and molecular weight of the corresponding anhydrous compound have also been given, to save time in calculations.

		Mol. Weight.
Acetanilid.....	$C_6H_5NH.C_2H_3O$	134.73
Acid, Acetic.....	$HC_2H_3O_2$	59.86
“ Arsenous.....	As_2O_3	197.68
“ Aurochloric.....	$HAuCl_4 + 2H_2O$	375.10
“ Benzoic	$HC_7H_5O_2$	121.71
“ Boric.....	H_3BO_3	61.78
“ Carbolie.....	C_6H_5OH	93.78
“ Chloroplatinic	$H_2PtCl_6 + 6H_2O$	516.28
“ Chromic.....	CrO_3	99.88
“ Citric	$H_3C_6H_5O_7 + H_2O$	209.50
“ “ dry.....	$H_3C_6H_5O_7$	191.54
“ Gallic	$HC_7H_5O_5 + H_2O$	187.55
“ “ dry	$HC_7H_5O_5$	169.59
“ Hydriodic	HI	127.53
“ Hydrobromic	HBr	80.76
“ Hydrochloric	HCl	36.37
“ Hydrocyanic.....	HCN	26.98
“ Hydrosulphuric (See Hydrogen Sulphide).		
“ Hypophosphorous	HPH_2O_2	65.88
“ Lactic	$HC_3H_5O_3$	89.79
“ Nitric	HNO_3	62.89
“ Oleic	$HC_{18}H_{33}O_2$	281.38
“ Oxalic.....	$H_2C_2O_4 + 2H_2O$	125.70
“ “ dry.....	$H_2C_2O_4$	89.78

Acid, Phosphoric	H_3PO_4	97.80
“ Picric	$\text{C}_6\text{H}_2(\text{NO}_2)_3\text{OH}$	228.57
“ Pyroboric	$\text{H}_2\text{B}_4\text{O}_7$	157.32
“ Pyrogallie (See Pyrogallol).		
“ Salicylic	$\text{HC}_7\text{H}_5\text{O}_3$	137.67
“ Stearic	$\text{HC}_{18}\text{H}_{35}\text{O}_2$	283.38
“ Sulphuric	H_2SO_4	97.82
“ Sulphurous	H_2SO_3	81.86
“ Tannic	$\text{HC}_{14}\text{H}_9\text{O}_9$	321.22
“ Tartaric	$\text{H}_2\text{C}_4\text{H}_4\text{O}_6$	149.64
“ Tetraboric (See Pyroboric).		
Alcohol, ethylic	$\text{C}_2\text{H}_5\text{OH}$	45.90
“ methylic	CH_3OH	31.93
Aldehyde, ethylic	$\text{C}_2\text{H}_4\text{O}$	43.90
Alum (See Aluminum and Potassium Sulphate).		
Aluminum Hydrate	$\text{Al}_2(\text{OH})_6$	155.84
“ and Potassium Sulphate	$\text{Al}_2\text{K}_2(\text{SO}_4)_4 + 24\text{H}_2\text{O}$	946.46
“ “ “ dry	$\text{Al}_2\text{K}_2(\text{SO}_4)_4$	515.42
“ Sulphate	$\text{Al}_2(\text{SO}_4)_3 + 16\text{H}_2\text{O}$	628.90
“ “ dry	$\text{Al}_2(\text{SO}_4)_3$	341.54
Ammonia	NH_3	17.01
Ammonium Acetate	$\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$	76.87
“ Arsenite (Metarsenite)	NH_4AsO_2	124.83
“ Benzoate	$\text{NH}_4\text{C}_7\text{H}_5\text{O}_2$	138.72
“ Bromide	NH_4Br	97.77
“ Carbonate (normal)	$(\text{NH}_4)_2\text{CO}_3$	95.87
“ “ (U.S.P.)	$\text{NH}_4\text{HCO}_3 \cdot \text{NH}_4\text{NH}_2\text{CO}_2$	156.77
“ Chloride	NH_4Cl	53.38
“ Citrate	$(\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7$	242.57
“ Iodide	NH_4I	144.54
“ Lactate	$\text{NH}_4\text{C}_3\text{H}_5\text{O}_3$	106.80
“ Molybdate	$(\text{NH}_4)_2\text{MoO}_4$	195.76
“ Nitrate	NH_4NO_3	79.90
“ Oxalate	$(\text{NH}_4)_2\text{C}_2\text{O}_4 + \text{H}_2\text{O}$	141.76
“ “ dry	$(\text{NH}_4)_2\text{C}_2\text{O}_4$	123.80
“ Phosphate	$(\text{NH}_4)_2\text{HPO}_4$	131.82
“ Salicylate	$\text{NH}_4\text{C}_7\text{H}_5\text{O}_3$	154.68
“ Sulphate	$(\text{NH}_4)_2\text{SO}_4$	131.84
“ Sulphhydrate	NH_4HS	50.99
“ Sulphide	$(\text{NH}_4)_2\text{S}$	68.00
“ Tartrate	$(\text{NH}_4)_2\text{C}_4\text{H}_4\text{O}_6$	183.66
“ Valerianate	$\text{NH}_4\text{C}_5\text{H}_9\text{O}_2$	118.78
Amyl Nitrite	$\text{C}_5\text{H}_{11}\text{NO}_2$	116.78
Antimony Oxide (Trioxide)	Sb_2O_3	287.08
“ and Potassium Tartrate	$2\text{K}(\text{SbO})\text{C}_4\text{H}_4\text{O}_6 + \text{H}_2\text{O}$	662.42
“ “ “ dry	$\text{K}(\text{SbO})\text{C}_4\text{H}_4\text{O}_6$	322.23

Antimony Sulphide	Sb_2S_3	335.14
Apomorphine Hydrochlorate	$\text{C}_{17}\text{H}_{17}\text{NO}_2\text{HCl}$	302.79
Arsenic Iodide	AsI_3	454.49
“ Trioxide (See Acid, Arsenous).		
Atropine	$\text{C}_{17}\text{H}_{23}\text{NO}_3$	288.38
“ Sulphate	$(\text{C}_{17}\text{H}_{23}\text{NO}_3)_2\text{H}_2\text{SO}_4$	674.58
Barium Carbonate	BaCO_3	196.75
“ Chloride	$\text{BaCl}_2 + 2\text{H}_2\text{O}$	243.56
“ “ dry	BaCl_2	207.64
“ Dioxide	BaO_2	168.82
“ Hydrate	$\text{Ba}(\text{OH})_2$	170.82
“ Nitrate	$\text{Ba}(\text{NO}_3)_2$	260.68
Benzol (Benzene)	C_6H_6	77.82
Bismuth Citrate	$\text{BiC}_6\text{H}_5\text{O}_7$	397.44
“ Subcarbonate (approximately) ..	$(\text{BiO})_2\text{CO}_3$	509.57
“ Subnitrate (approximately) ..	$\text{BiONO}_3 \cdot \text{H}_2\text{O}$	304.71
Boron Trioxide	B_2O_3	69.68
Brucine	$\text{C}_{23}\text{H}_{26}\text{N}_2\text{O}_4 + 4\text{H}_2\text{O}$	465.01
“ dry	$\text{C}_{23}\text{H}_{26}\text{N}_2\text{O}_4$	393.17
Caffeine	$\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2 + \text{H}_2\text{O}$	211.68
“ dry	$\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$	193.72
Calcium Bromide	CaBr_2	199.43
“ Carbonate	CaCO_3	99.76
“ Chloride	$\text{CaCl}_2 + 6\text{H}_2\text{O}$	218.41
“ “ dry	CaCl_2	110.65
“ Hydrate	$\text{Ca}(\text{OH})_2$	73.83
“ Hypophosphite	$\text{Ca}(\text{PH}_2\text{O}_2)_2$	169.67
“ Oxide	CaO	55.87
“ Phosphate	$\text{Ca}_3(\text{PO}_4)_2$	309.33
“ Sulphate (Gypsum)	$\text{CaSO}_4 + 2\text{H}_2\text{O}$	171.65
“ “ dry	CaSO_4	135.73
“ Sulphide (Monosulphide)	CaS	71.89
Camphor	$\text{C}_{10}\text{H}_{16}\text{O}$	151.66
“ Monobromated	$\text{C}_{10}\text{H}_{15}\text{BrO}$	230.42
Carbon Disulphide	CS_2	75.93
Cerium Oxalate	$\text{Ce}_2(\text{C}_2\text{O}_4)_3 + 9\text{H}_2\text{O}$	704.78
“ “ dry	$\text{Ce}_2(\text{C}_2\text{O}_4)_3$	543.14
Chloral Hydrate	$\text{C}_2\text{HCl}_3\text{O} + \text{H}_2\text{O}$	164.97
“ anhydrous	$\text{C}_2\text{HCl}_3\text{O}$	147.01
Chloroform	CHCl_3	119.08
Cinchonidine Sulphate	$(\text{C}_{19}\text{H}_{22}\text{N}_2\text{O})_2\text{H}_2\text{SO}_4 + 3\text{H}_2\text{O}$	738.52
“ “ dry	$(\text{C}_{19}\text{H}_{22}\text{N}_2\text{O})_2\text{H}_2\text{SO}_4$	684.64
Cinchonine	$\text{C}_{19}\text{H}_{22}\text{N}_2\text{O}$	293.41
“ Sulphate	$(\text{C}_{19}\text{H}_{22}\text{N}_2\text{O})_2\text{H}_2\text{SO}_4 + 2\text{H}_2\text{O}$	720.56
“ “ dry	$(\text{C}_{19}\text{H}_{22}\text{N}_2\text{O})_2\text{H}_2\text{SO}_4$	684.64
Cobaltous Nitrate	$\text{Co}(\text{NO}_3)_2 + 6\text{H}_2\text{O}$	290.14
Cocaine Hydrochlorate	$\text{C}_{17}\text{H}_{21}\text{NO}_4\text{HCl}$	338.71
Codeine	$\text{C}_{18}\text{H}_{21}\text{NO}_3 + \text{H}_2\text{O}$	316.31

Codeine, dry	$C_{18}H_{21}NO_3$	298.35
Cupric Ammonium Sulphate	$Cu(NH_3)_4SO_4 + H_2O$	245.00
“ Sulphate	$CuSO_4 + 5H_2O$	248.80
“ “ dry	$CuSO_4$	159.00
“ Tartrate	$CuC_4H_4O_6 + 3H_2O$	264.70
Diphenylamine	$(C_6H_5)_2NH$	168.65
Elaterin	$C_{20}H_{28}O_5$	347.20
Ether		
(See Ethyl Oxide).		
Ethyl Acetate	$C_2H_5C_2H_3O_2$	87.80
“ Nitrite	$C_2H_5NO_2$	74.87
“ Oxide (Æther, U.S.P.)	$(C_2H_5)_2O$	73.84
Eucalyptol	$C_{10}H_{18}O$	153.66
Ferric Acetate	$Fe_2(C_2H_3O_2)_6$	464.92
“ Ammonium Sulphate	$Fe_2(NH_4)_2(SO_4)_4 + 24H_2O$	962.10
“ “ “ dry	$Fe_2(NH_4)_2(SO_4)_4$	531.06
“ Chloride	$Fe_2Cl_6 + 12H_2O$	539.50
“ “ dry	Fe_2Cl_6	323.98
“ Hydrate	$Fe_2(OH)_6$	213.52
“ Hypophosphite	$Fe_2(PH_2O_2)_6$	501.04
“ Nitrate	$Fe_2(NO_3)_6$	483.10
“ Oxide	Fe_2O_3	159.64
“ Phosphate (normal, not U.S.P.)	$Fe_2(PO_4)_2$	301.36
“ Pyrophosphate (normal, not U.S.P.)	$Fe_4(P_2O_7)_3$	744.44
“ Subsulphate (variable)		
“ Sulphate	$Fe_2(SO_4)_3$	399.22
“ Valerianate (variable)		
Ferrous Bromide	$FeBr_2$	215.40
“ Carbonate	$FeCO_3$	115.73
“ Iodide	FeI_2	308.94
“ Lactate	$Fe(C_3H_5O_3)_2 + 3H_2O$	287.34
“ Sulphate	$FeSO_4 + 7H_2O$	277.42
“ “ dry	$FeSO_4$	151.70
“ Sulphide	FeS	87.86
Glucose		
(See Sugar, Grape).		
Glycerin	$C_3H_5(OH)_3$	91.79
Glyceryl Trinitrate	$C_3H_5(NO_3)_3$	226.58
Gold Chloride	$AuCl_3$	302.81
Hydrastinine Hydrochlorate	$C_{11}H_{11}NO_2HCl$	224.97
Hydrogen Dioxide	H_2O_2	33.92
“ Sulphide	H_2S	33.98
Hyoscine Hydrobromate	$C_{17}H_{21}NO_4HBr + 3H_2O$	436.98
“ “ dry	$C_{17}H_{21}NO_4HBr$	383.10
Hyoscyamine Hydrobromate	$C_{17}H_{23}NO_3HBr$	369.14
“ Sulphate	$(C_{17}H_{23}NO_3)_2H_2SO_4$	674.58
Iodoform	CHI_3	392.56
Lead Acetate	$Pb(C_2H_3O_2)_2 + 3H_2O$	378.00
“ “ dry	$Pb(C_2H_3O_2)_2$	324.12

Lead Carbonate	$(\text{PbCO}_3)_2\text{Pb}(\text{OH})_2$	772.82
“ Iodide	PbI_2	459.46
“ Nitrate	$\text{Pb}(\text{NO}_3)_2$	330.18
“ Oxide	PbO	222.36
“ Subacetate (approximately)	$\text{Pb}_2\text{O}(\text{C}_2\text{H}_3\text{O}_2)_2$	546.48
Lime		
(See Calcium Oxide).		
Lithium Benzoate	$\text{LiC}_7\text{H}_5\text{O}_2$	127.72
“ Bromide	LiBr	86.77
“ Carbonate	Li_2CO_3	73.87
“ Citrate	$\text{Li}_3\text{C}_6\text{H}_5\text{O}_7$	209.57
“ Salicylate	$\text{LiC}_7\text{H}_5\text{O}_3$	143.68
Magnesia		
(See Magnesium Oxide).		
Magnesium Carbonate (approximately) ..	$(\text{MgCO}_3)_4\text{Mg}(\text{OH})_2 + 5\text{H}_2\text{O}$	484.62
“ Oxide	MgO	40.26
“ Sulphate	$\text{MgSO}_4 + 7\text{H}_2\text{O}$	245.84
“ “ dry	MgSO_4	120.12
Manganese Dioxide	MnO_2	86.72
Manganous Sulphate	$\text{MnSO}_4 + 4\text{H}_2\text{O}$	222.46
“ “ dry	MnSO_4	150.62
Menthol	$\text{C}_{10}\text{H}_{19}\text{OH}$	155.66
Mercuric Ammonium Chloride	NH_2HgCl	251.18
“ Chloride	HgCl_2	270.54
“ Cyanide	$\text{Hg}(\text{CN})_2$	251.76
“ Iodide	HgI_2	452.86
“ Nitrate	$\text{Hg}(\text{NO}_3)_2$	323.58
“ Oxide	HgO	215.76
“ Potassium Iodide	$\text{HgI}_2 + 2\text{KI}$	783.98
“ Subsulphate	$\text{Hg}(\text{HgO})_2\text{SO}_4$	727.14
Mercurous Chloride	Hg_2Cl_2	470.34
“ Iodide	Hg_2I_2	652.66
“ Nitrate	$\text{Hg}_2(\text{NO}_3)_2 + 2\text{H}_2\text{O}$	559.30
Methyl Salicylate	$\text{CH}_3\text{C}_7\text{H}_5\text{O}_3$	151.64
Morphine	$\text{C}_{17}\text{H}_{19}\text{NO}_3 + \text{H}_2\text{O}$	302.34
“ dry	$\text{C}_{17}\text{H}_{19}\text{NO}_3$	284.38
“ Acetate	$\text{C}_{17}\text{H}_{19}\text{NO}_3\text{C}_2\text{H}_4\text{O}_2 + 3\text{H}_2\text{O}$	398.12
“ Hydrochlorate	$\text{C}_{17}\text{H}_{19}\text{NO}_3\text{HCl} + 3\text{H}_2\text{O}$	374.63
“ “ dry	$\text{C}_{17}\text{H}_{19}\text{NO}_3\text{HCl}$	320.75
“ Sulphate	$(\text{C}_{17}\text{H}_{19}\text{NO}_3)_2\text{H}_2\text{SO}_4 + 5\text{H}_2\text{O}$	756.38
“ “ dry	$(\text{C}_{17}\text{H}_{19}\text{NO}_3)_2\text{H}_2\text{SO}_4$	666.58
Naphtalin	C_{10}H_8	127.70
Naphtol	$\text{C}_{10}\text{H}_7(\text{OH})$	143.66
Nitrogen Dioxide	NO	29.97
Nitroglycerin		
(See Glyceryl Trinitrate).		
Paraldehyde	$\text{C}_6\text{H}_{12}\text{O}_3$	131.70
Phenol		
(See Acid, Carbolie).		

Physostigmine Salicylate	$C_{15}H_{21}N_3O_2C_7H_6O_3$	412.17
“ Sulphate	$(C_{15}H_{21}N_3O_2)_2H_2SO_4$	934.28
Picrotoxin	$C_{30}H_{34}O_{13}$	600.58
Pilocarpine Hydrochlorate	$C_{11}H_{16}N_2O_2HCl$	243.98
Piperin	$C_{17}H_{19}NO_3$	284.38
Platinic Chloride	$PtCl_4$	335.78
Potassa (See Potassium Hydrate).		
Potassium Acetate	$KC_2H_3O_2$	97.89
“ Arsenite (Metarsenite)	$KAsO_2$	145.85
“ Benzoate	$KC_7H_5O_2 + 3H_2O$	213.62
“ “ dry	$KC_7H_5O_2$	159.74
“ Bicarbonate	$KHCO_3$	99.88
“ Bichromate (See Dichromate).		
“ Bitartrate	$KHC_4H_4O_6$	187.67
“ Bromate	$KBrO_3$	166.67
“ Bromide	KBr	118.79
“ Carbonate	K_2CO_3	137.91
“ Chlorate	$KClO_3$	122.28
“ Chloride	KCl	74.40
“ Chromate	K_2CrO_4	193.90
“ Citrate	$K_3C_6H_5O_7 + H_2O$	323.59
“ “ dry	$K_3C_6H_5O_7$	305.63
“ Cyanide	KCN	65.01
“ Dichromate	$K_2Cr_2O_7$	293.78
“ Ferricyanide	$K_6Fe_2(CN)_{12}$	657.70
“ Ferrocyanide	$K_4Fe(CN)_6 + 3H_2O$	421.76
“ “ dry	$K_4Fe(CN)_6$	367.88
“ Hydrate	KOH	55.99
“ Hypophosphite	KPH_2O_2	103.91
“ Iodide	KI	165.56
“ Lactate	$KC_3H_5O_3$	127.82
“ Nitrate	KNO_3	100.92
“ Permanganate	$KMnO_4$	157.67
“ Phosphate	K_2HPO_4	173.86
“ Salicylate	$KC_7H_5O_3$	175.70
“ and Sodium Tartrate	$KNaC_4H_4O_6 + 4H_2O$	281.51
“ “ “ dry	$KNaC_4H_4O_6$	209.67
“ Sulphate	K_2SO_4	173.88
“ Sulphite	$K_2SO_3 + 2H_2O$	193.84
“ “ dry	K_2SO_3	157.92
“ Sulphocyanate	$KSCN$	96.99
“ Tartrate	$2K_2C_4H_4O_6 + H_2O$	469.36
“ “ dry	$K_2C_4H_4O_6$	225.70
Propenyl Trinitrate (See Glyceryl Trinitrate).		
Pyrogallol	$C_6H_3(OH)_3$	125.70
Quinidine Sulphate	$(C_{20}H_{24}N_2O_2)_2H_2SO_4 + 2H_2O$	780.42

Quinidine Sulphate, dry.....	$(C_{20}H_{24}N_2O_2)_2H_2SO_4$	744.50
Quinine.....	$C_{20}H_{24}N_2O_2 + 3H_2O$	377.22
“ dry.....	$C_{20}H_{24}N_2O_2$	323.34
“ Bisulphate.....	$C_{20}H_{24}N_2O_2H_2SO_4 + 7H_2O$	546.88
“ “ dry.....	$C_{20}H_{24}N_2O_2H_2SO_4$	421.16
“ Hydrobromate.....	$C_{20}H_{24}N_2O_2HBr + H_2O$	422.06
“ “ dry.....	$C_{20}H_{24}N_2O_2HBr$	404.10
“ Hydrochlorate.....	$C_{20}H_{24}N_2O_2HCl + 2H_2O$	395.63
“ “ dry.....	$C_{20}H_{24}N_2O_2HCl$	359.71
“ Sulphate.....	$(C_{20}H_{24}N_2O_2)_2H_2SO_4 + 7H_2O$	870.22
“ “ dry.....	$(C_{20}H_{24}N_2O_2)_2H_2SO_4$	744.50
“ Valerianate.....	$C_{20}H_{24}N_2O_2C_5H_{10}O_2 + H_2O$	443.07
Resorcin.....	$C_6H_4(OH)_2$	109.74
Salicin.....	$C_{13}H_{18}O_7$	285.33
Salol.....	$C_6H_5C_7H_5O_3$	213.49
Santonin.....	$C_{15}H_{18}O_3$	245.43
Silver Cyanide.....	$AgCN$	133.64
“ Iodide.....	AgI	234.19
“ Nitrate.....	$AgNO_3$	169.55
“ Oxide.....	Ag_2O	231.28
“ Sulphate.....	Ag_2SO_4	311.14
Soda		
(See Sodium Hydrate).		
Sodium Acetate.....	$NaC_2H_3O_2 + 3H_2O$	135.74
“ “ dry.....	$NaC_2H_3O_2$	81.86
“ Arsenate.....	$Na_2HASO_4 + 7H_2O$	311.46
“ “ dry.....	Na_2HASO_4	185.74
“ Arsenite (Metarsenite).....	$NaAsO_2$	129.82
“ Benzoate.....	$NaC_7H_5O_2$	143.71
“ Bicarbonate.....	$NaHCO_3$	83.85
“ Bisulphite.....	$NaHSO_3$	103.86
“ Bitartrate.....	$NaHC_4H_4O_6 + H_2O$	189.60
“ Borate.....	$Na_2B_4O_7 + 10H_2O$	380.92
“ “ dry.....	$Na_2B_4O_7$	201.32
“ Bromate.....	$NaBrO_3$	150.64
“ Bromide.....	$NaBr$	102.76
“ Carbonate.....	$Na_2CO_3 + 10H_2O$	285.45
“ “ dry.....	Na_2CO_3	105.85
“ Chlorate.....	$NaClO_3$	106.25
“ Chloride.....	$NaCl$	58.37
“ Citrate.....	$2Na_3C_6H_5O_7 + 11H_2O$	712.64
“ “ dry.....	$Na_3C_6H_5O_7$	257.54
“ Cobaltic Nitrite.....	$Co_2(NO_2)_6 + 6NaNO_2 + H_2O$	824.32
“ Hydrate.....	$NaOH$	39.96
“ Hypophosphite.....	$NaPH_2O_2 + H_2O$	105.84
“ Hyposulphite.....	$Na_2S_2O_3 + 5H_2O$	247.64
“ “ dry.....	$Na_2S_2O_3$	157.84
“ Iodide.....	NaI	149.53
“ Lactate.....	$NaC_3H_5O_3$	111.79

Sodium Nitrate.....	NaNO_3	84.89
“ Nitrite	NaNO_2	68.93
“ Nitroprusside.....	$\text{Na}_2\text{Fe}(\text{NO})(\text{CN})_5 + 2\text{H}_2\text{O}$	297.67
“ Phosphate.....	$\text{Na}_2\text{HPO}_4 + 12\text{H}_2\text{O}$	357.32
“ “ dry.....	Na_2HPO_4	141.80
“ Pyrophosphate	$\text{Na}_4\text{P}_2\text{O}_7 + 10\text{H}_2\text{O}$	445.24
“ “ dry	$\text{Na}_4\text{P}_2\text{O}_7$	265.64
“ Salicylate	$\text{NaC}_7\text{H}_5\text{O}_3$	159.67
“ Sulphate	$\text{Na}_2\text{SO}_4 + 10\text{H}_2\text{O}$	321.42
“ “ dry	Na_2SO_4	141.82
“ Sulphite	$\text{Na}_2\text{SO}_3 + 7\text{H}_2\text{O}$	251.58
“ “ dry.....	Na_2SO_3	125.86
“ Sulphocarbonate	$\text{NaSO}_3\text{C}_6\text{H}_4(\text{OH}) + 2\text{H}_2\text{O}$	231.56
“ Tartrate.....	$\text{Na}_2\text{C}_4\text{H}_4\text{O}_6 + 2\text{H}_2\text{O}$	229.56
“ Thiosulphate (See Hyposulphite).		
Sparteine Sulphate	$\text{C}_{15}\text{H}_{26}\text{N}_2\text{H}_2\text{SO}_4 + 4\text{H}_2\text{O}$	403.23
“ “ dry	$\text{C}_{15}\text{H}_{26}\text{N}_2\text{H}_2\text{SO}_4$	331.39
Stannous Chloride.....	$\text{SnCl}_2 + 2\text{H}_2\text{O}$	225.46
Strontium Bromide.....	$\text{SrBr}_2 + 6\text{H}_2\text{O}$	354.58
“ “ dry	SrBr_2	246.82
“ Iodide	$\text{SrI}_2 + 6\text{H}_2\text{O}$	448.12
“ “ dry	SrI_2	340.36
“ Lactate	$\text{Sr}(\text{C}_3\text{H}_5\text{O}_3)_2 + 3\text{H}_2\text{O}$	318.76
“ “ dry	$\text{Sr}(\text{C}_3\text{H}_5\text{O}_3)_2$	264.88
Strychnine	$\text{C}_{21}\text{H}_{22}\text{N}_2\text{O}_2$	333.31
“ Sulphate	$(\text{C}_{21}\text{H}_{22}\text{N}_2\text{O}_2)_2\text{H}_2\text{SO}_4 + 5\text{H}_2\text{O}$	854.24
“ “ dry	$(\text{C}_{21}\text{H}_{22}\text{N}_2\text{O}_2)_2\text{H}_2\text{SO}_4$	764.44
Sugar, Cane	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$	341.20
“ Grape	$\text{C}_6\text{H}_{12}\text{O}_6$	179.58
“ Milk	$\text{C}_{12}\text{H}_{22}\text{O}_{11} + \text{H}_2\text{O}$	359.16
Sulphur Dioxide.....	SO_2	63.90
Terebene.....	$\text{C}_{10}\text{H}_{16}$	135.70
Terpin Hydrate.....	$\text{C}_{10}\text{H}_{18}(\text{OH})_2 + \text{H}_2\text{O}$	189.58
Thiosinamine	$\text{CS.N}_2\text{H}_3(\text{C}_3\text{H}_5)$	115.88
Thymol	$\text{C}_{10}\text{H}_{14}\text{O}$	149.66
Water	H_2O	17.96
Zinc Acetate.....	$\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2 + 2\text{H}_2\text{O}$	218.74
“ “ dry.....	$\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2$	182.82
“ Bromide	ZnBr_2	224.62
“ Carbonate (normal, not U.S.P.)	ZnCO_3	124.95
“ Chloride	ZnCl_2	135.84
“ Iodide	ZnI_2	318.16
“ Oxide.....	ZnO	81.06
“ Phosphide	Zn_3P_2	257.22
“ Sulphate	$\text{ZnSO}_4 + 7\text{H}_2\text{O}$	286.64
“ “ dry	ZnSO_4	160.92
“ Valerianate	$\text{Zn}(\text{C}_5\text{H}_9\text{O}_2)_2 + 2\text{H}_2\text{O}$	302.56

TABLES.

TABLE OF ATOMIC WEIGHTS.

According to L. Meyer and K. Seubert.

Names of elements occurring in pharmacopœial and medicinal chemicals, or in reagents used for pharmacopœial tests, are distinguished by the sign † placed after them.

Name.	Symbol.	Atomic Weight.	Name.	Symbol.	Atomic Weight.
Aluminum †	Al	27.04	Molybdenum † . .	Mo	95.9
Antimony †	Sb	119.6	Nickel	Ni	58.6
Arsenic †	As	74.9	Nitrogen †	N	14.01
Barium †	Ba	136.9	Osmium	Os	190.3
Beryllium ¹	Be	9.03	Oxygen †	O	15.96
Bismuth †	Bi	208.9	Palladium	Pd	106.35
Boron †	B	10.9	Phosphorus † . . .	P	30.96
Bromine †	Br	79.76	Platinum †	Pt	194.3
Cadmium	Cd	111.5	Potassium †	K	39.03
Cæsium	Cs	132.7	Rhodium	Rh	102.9
Calcium †	Ca	39.91	Rubidium	Rb	85.2
Carbon †	C	11.97	Ruthenium	Ru	101.4
Cerium †	Ce	139.9	Samarium	Sm	149.62
Chlorine †	Cl	35.37	Scandium	Sc	43.97
Chromium †	Cr	52.0	Selenium	Se	78.87
Cobalt †	Co	58.6	Silicon †	Si	28.3
Columbium ²	Cb	93.7	Silver †	Ag	107.66
Copper †	Cu	63.18	Sodium †	Na	23.0
Didymium ³	Di	142.0	Strontium †	Sr	87.3
Erbium	Er	166.0	Sulphur †	S	31.98
Fluorine	F	19.0	Tantalum	Ta	182.0
Gallium	Ga	69.9	Tellurium	Te	125.0
Germanium	Ge	72.3	Terbium	Tb	159.1
Gold †	Au	196.7	Thallium	Tl	203.7
Hydrogen †	H	1.0	Thorium	Th	231.9
Indium	In	113.6	Tin †	Sn	118.8
Iodine †	I	126.53	Titanium	Ti	48.0
Iridium	Ir	192.5	Tungsten	W	183.6
Iron †	Fe	55.88	Uranium	U	238.8
Lanthanum	La	138.2	Vanadium	V	51.1
Lead †	Pb	206.4	Ytterbium	Yb	172.6
Lithium †	Li	7.01	Yttrium	Yt	88.9
Magnesium †	Mg	24.3	Zinc †	Zn	65.1
Manganese †	Mn	54.8	Zirconium	Zr	90.4
Mercury †	Hg	199.8			

¹ Also called Glucinum, Gl = 9.03.² Also called Niobium, Nb = 93.7.³ Composed of Neo- and Praseo-Didymium.

MULTIPLES OF SOME ATOMIC AND MOLECULAR WEIGHTS IN FREQUENT USE.

1.	H	1	2	3	4	5	6	7	8	9	H	1.
2.	O	15.96	31.92	47.88	63.84	79.80	95.76	111.72	127.68	143.64	O	2.
3.	OH	16.96	33.92	50.88	67.84	84.80	101.76	118.72	135.68	152.64	OH	3.
4.	H ₂ O	17.96	35.92	53.88	71.84	89.80	107.76	125.72	143.68	161.64	H ₂ O	4.
5.	N	14.01	28.02	42.03	56.04	70.05	84.06	98.07	112.08	126.09	N	5.
6.	NH ₂	16.01	32.02	48.03	64.04	80.05	96.06	112.07	128.08	144.09	NH ₂	6.
7.	NH ₃	17.01	34.02	51.03	68.04	85.05	102.06	119.07	136.08	153.09	NH ₃	7.
8.	NH ₄	18.01	36.02	54.03	72.04	90.05	108.06	126.07	144.08	162.09	NH ₄	8.
9.	NO ₂	45.93	91.86	137.79	183.72	229.65	275.58	321.51	367.44	413.37	NO ₂	9.
10.	NO ₃	61.89	123.78	185.67	247.56	309.45	371.34	433.23	495.12	557.01	NO ₃	10.
11.	C	11.97	23.94	35.91	47.88	59.85	71.82	83.79	95.76	107.73	C	11.
12.	CO ₂	59.85	119.70	179.55	239.40	299.25	359.10	418.95	478.80	538.65	CO ₂	12.
13.	CN	25.98	51.96	77.94	103.92	129.90	155.88	181.86	207.84	233.82	CN	13.
14.	Cl	35.37	70.74	106.11	141.48	176.85	212.22	247.59	282.96	318.33	Cl	14.
15.	Br	79.76	159.52	239.28	319.04	398.80	478.56	558.32	638.08	717.84	Br	15.
16.	I	126.53	253.06	379.59	506.12	632.65	759.18	885.71	1012.24	1138.77	I	16.
17.	S	31.98	63.96	95.94	127.92	159.90	191.88	223.86	255.84	287.82	S	17.
18.	SO ₄	95.82	191.64	287.46	383.28	479.10	574.92	670.74	766.56	862.38	SO ₄	18.
19.	PO ₄	94.80	189.60	284.40	379.20	474.00	568.80	663.60	758.40	853.20	PO ₄	19.
20.	PH ₂ O ₂	64.88	129.76	194.64	259.52	324.40	389.28	454.16	519.04	583.92	PH ₂ O ₂	20.
21.	Na	23.00	46.00	69.00	92.00	115.00	138.00	161.00	184.00	207.00	Na	21.
22.	K	39.03	78.06	117.09	156.12	195.15	234.18	273.21	312.24	351.27	K	22.
		1	2	3	4	5	6	7	8	9		

TABLE OF THERMOMETRIC EQUIVALENTS

According to the Centigrade and Fahrenheit Scales.

Given Sought
Centigrade: Fahrenheit:

Given Sought
Fahrenheit: Centigrade:

$n^{\circ} \text{C.} = \frac{9n^{\circ}}{5} + 32$

$n^{\circ} \text{F.} = \frac{5(n^{\circ} - 32)}{9}$

C.°	F.°	C.°	F.°	C.°	F.°	C.°	F.°
—40	—40						
—39.4444	—39	—24.4444	—12	—9.4444	15	0.5556	33
—39	—38.2	—24	—11.2	—9	15.8	1	33.8
—38.8889	—38	—23.8889	—11	—8.8889	16	1.1111	34
—38.3333	—37	—23.3333	—10	—8.3333	17	1.6667	35
—38	—36.4	—23	—9.4	—8	17.6	2	35.6
—37.7778	—36	—22.7778	—9	—7.7778	18	2.2222	36
—37.2222	—35	—22.2222	—8	—7.2222	19	2.7778	37
—37	—34.6	—22	—7.6	—7	19.4	3	37.4
—36.6667	—34	—21.6667	—7	—6.6667	20	3.3333	38
—36.1111	—33	—21.1111	—6	—6.1111	21	3.8889	39
—36	—32.8	—21	—5.8	—6	21.2	4	39.2
—35.5556	—32	—20.5556	—5	—5.5556	22	4.4444	40
—35	—31	—20	—4	—5	23	5	41
—34.4444	—30	—19.4444	—3	—4.4444	24	5.5556	42
—34	—29.2	—19	—2.2	—4	24.8	6	42.8
—33.8889	—29	—18.8889	—2	—3.8889	25	6.1111	43
—33.3333	—28	—18.3333	—1	—3.3333	26	6.6667	44
—33	—27.4	—18	—0.4	—3	26.6	7	44.6
—32.7778	—27	—17.7778	0	—2.7778	27	7.2222	45
—32.2222	—26	—17.2222	1	—2.2222	28	7.7778	46
—32	—25.6	—17	1.4	—2	28.4	8	46.4
—31.6667	—25	—16.6667	2	—1.6667	29	8.3333	47
—31.1111	—24	—16.1111	3	—1.1111	30	8.8889	48
—31	—23.8	—16	3.2	—1	30.2	9	48.2
—30.5556	—23	—15.5556	4	—0.5556	31	9.4444	49
—30	—22	—15	5	0	32	10	50
—29.4444	—21	—14.4444	6			10.5556	51
—29	—20.2	—14	6.8			11	51.8
—28.8889	—20	—13.8889	7			11.1111	52
—28.3333	—19	—13.3333	8			11.6667	53
—28	—18.4	—13	8.6			12	53.6
—27.7778	—18	—12.7778	9			12.2222	54
—27.2222	—17	—12.2222	10			12.7778	55
—27	—16.6	—12	10.4			13	55.4
—26.6667	—16	—11.6667	11			13.3333	56
—26.1111	—15	—11.1111	12			13.8889	57
—26	—14.8	—11	12.2			14	57.2
—25.5556	—14	—10.5556	13			14.4444	58
—25	—13	—10	14			15	59

Table of Thermometric Equivalents.—*Continued.*

C.°	F.°	C.°	F.°	C.°	F.°	C.°	F.°
15.5556	60	35.5556	96	55.5556	132	75.5556	168
16	60.8	36	96.8	56	132.8	76	168.8
16.1111	61	36.1111	97	56.1111	133	76.1111	169
16.6667	62	36.6667	98	56.6667	134	76.6667	170
17	62.6	37	98.6	57	134.6	77	170.6
17.2222	63	37.2222	99	57.2222	135	77.2222	171
17.7778	64	37.7778	100	57.7778	136	77.7778	172
18	64.4	38	100.4	58	136.4	78	172.4
18.3333	65	38.3333	101	58.3333	137	78.3333	173
18.8889	66	38.8889	102	58.8889	138	78.8889	174
19	66.2	39	102.2	59	138.2	79	174.2
19.4444	67	39.4444	103	59.4444	139	79.4444	175
20	68	40	104	60	140	80	176
20.5556	69	40.5556	105	60.5556	141	80.5556	177
21	69.8	41	105.8	61	141.8	81	177.8
21.1111	70	41.1111	106	61.1111	142	81.1111	178
21.6667	71	41.6667	107	61.6667	143	81.6667	179
22	71.6	42	107.6	62	143.6	82	179.6
22.2222	72	42.2222	108	62.2222	144	82.2222	180
22.7778	73	42.7778	109	62.7778	145	82.7778	181
23	73.4	43	109.4	63	145.4	83	181.4
23.3333	74	43.3333	110	63.3333	146	83.3333	182
23.8889	75	43.8889	111	63.8889	147	83.8889	183
24	75.2	44	111.2	64	147.2	84	183.2
24.4444	76	44.4444	112	64.4444	148	84.4444	184
25	77	45	113	65	149	85	185
25.5556	78	45.5556	114	65.5556	150	85.5556	186
26	78.8	46	114.8	66	150.8	86	186.8
26.1111	79	46.1111	115	66.1111	151	86.1111	187
26.6667	80	46.6667	116	66.6667	152	86.6667	188
27	80.6	47	116.6	67	152.6	87	188.6
27.2222	81	47.2222	117	67.2222	153	87.2222	189
27.7778	82	47.7778	118	67.7778	154	87.7778	190
28	82.4	48	118.4	68	154.4	88	190.4
28.3333	83	48.3333	119	68.3333	155	88.3333	191
28.8889	84	48.8889	120	68.8889	156	88.8889	192
29	84.2	49	120.2	69	156.2	89	192.2
29.4444	85	49.4444	121	69.4444	157	89.4444	193
30	86	50	122	70	158	90	194
30.5556	87	50.5556	123	70.5556	159	90.5556	195
31	87.8	51	123.8	71	159.8	91	195.8
31.1111	88	51.1111	124	71.1111	160	91.1111	196
31.6667	89	51.6667	125	71.6667	161	91.6667	197
32	89.6	52	125.6	72	161.6	92	197.6
32.2222	90	52.2222	126	72.2222	162	92.2222	198
32.7778	91	52.7778	127	72.7778	163	92.7778	199
33	91.4	53	127.4	73	163.4	93	199.4
33.3333	92	53.3333	128	73.3333	164	93.3333	200
33.8889	93	53.8889	129	73.8889	165	93.8889	201
34	93.2	54	129.2	74	165.2	94	201.2
34.4444	94	54.4444	130	74.4444	166	94.4444	202
35	95	55	131	75	167	95	203

Table of Thermometric Equivalents.—*Continued.*

C.°	F.°	C.°	F.°	C.°	F.°	C.°	F.°
95.5556	204	115.5556	240	135.5556	276	155.5556	312
96	204.8	116	240.8	136	276.8	156	312.8
96.1111	205	116.1111	241	136.1111	277	156.1111	313
96.6667	206	116.6667	242	136.6667	278	156.6667	314
97	206.6	117	242.6	137	278.6	157	314.6
97.2222	207	117.2222	243	137.2222	279	157.2222	315
97.7778	208	117.7778	244	137.7778	280	157.7778	316
98	208.4	118	244.4	138	280.4	158	316.4
98.3333	209	118.3333	245	138.3333	281	158.3333	317
98.8889	210	118.8889	246	138.8889	282	158.8889	318
99	210.2	119	246.2	139	282.2	159	318.2
99.4444	211	119.4444	247	139.4444	283	159.4444	319
100	212	120	248	140	284	160	320
100.5556	213	120.5556	249	140.5556	285	160.5556	321
101	213.8	121	249.8	141	285.8	161	321.8
101.1111	214	121.1111	250	141.1111	286	161.1111	322
101.6667	215	121.6667	251	141.6667	287	161.6667	323
102	215.6	122	251.6	142	287.6	162	323.6
102.2222	216	122.2222	252	142.2222	288	162.2222	324
102.7778	217	122.7778	253	142.7778	289	162.7778	325
103	217.4	123	253.4	143	289.4	163	325.4
103.3333	218	123.3333	254	143.3333	290	163.3333	326
103.8889	219	123.8889	255	143.8889	291	163.8889	327
104	219.2	124	255.2	144	291.2	164	327.2
104.4444	220	124.4444	256	144.4444	292	164.4444	328
105	221	125	257	145	293	165	329
105.5556	222	125.5556	258	145.5556	294	165.5556	330
106	222.8	126	258.8	146	294.8	166	330.8
106.1111	223	126.1111	259	146.1111	295	166.1111	331
106.6667	224	126.6667	260	146.6667	296	166.6667	332
107	224.6	127	260.6	147	296.6	167	332.6
107.2222	225	127.2222	261	147.2222	297	167.2222	333
107.7778	226	127.7778	262	147.7778	298	167.7778	334
108	226.4	128	262.4	148	298.4	168	334.4
108.3333	227	128.3333	263	148.3333	299	168.3333	335
108.8889	228	128.8889	264	148.8889	300	168.8889	336
109	228.2	129	264.2	149	300.2	169	336.2
109.4444	229	129.4444	265	149.4444	301	169.4444	337
110	230	130	266	150	302	170	338
110.5556	231	130.5556	267	150.5556	303	170.5556	339
111	231.8	131	267.8	151	303.8	171	339.8
111.1111	232	131.1111	268	151.1111	304	171.1111	340
111.6667	233	131.6667	269	151.6667	305	171.6667	341
112	233.6	132	269.6	152	305.6	172	341.6
112.2222	234	132.2222	270	152.2222	306	172.2222	342
112.7778	235	132.7778	271	152.7778	307	172.7778	343
113	235.4	133	271.4	153	307.4	173	343.4
113.3333	236	133.3333	272	153.3333	308	173.3333	344
113.8889	237	133.8889	273	153.8889	309	173.8889	345
114	237.2	134	273.2	154	309.2	174	345.2
114.4444	238	134.4444	274	154.4444	310	174.4444	346
115	239	135	275	155	311	175	347

Table of Thermometric Equivalents.—*Continued.*

C.°	F.°	C.°	F.°	C.°	F.°	C.°	F.°
175.5556 176	348 348.8	195.5556 196	384 384.8	215.5556 216	420 420.8	235.5556 236	456 456.8
176.1111	349	196.1111	385	216.1111	421	236.1111	457
176.6667	350	196.6667	386	216.6667	422	236.6667	458
177	350.6	197	386.6	217	422.6	237	458.6
177.2222	351	197.2222	387	217.2222	423	237.2222	459
177.7778	352	197.7778	388	217.7778	424	237.7778	460
178	352.4	198	388.4	218	424.4	238	460.4
178.3333	353	198.3333	389	218.3333	425	238.3333	461
178.8889	354	198.8889	390	218.8889	426	238.8889	462
179	354.2	199	390.2	219	426.2	239	462.2
179.4444	355	199.4444	391	219.4444	427	239.4444	463
180	356	200	392	220	428	240	464
180.5556 181	357 357.8	200.5556 201	393 393.8	220.5556 221	429 429.8	240.5556 241	465 465.8
181.1111	358	201.1111	394	221.1111	430	241.1111	466
181.6667	359	201.6667	395	221.6667	431	241.6667	467
182	359.6	202	395.6	222	431.6	242	467.6
182.2222	360	202.2222	396	222.2222	432	242.2222	468
182.7778	361	202.7778	397	222.7778	433	242.7778	469
183	361.4	203	397.4	223	433.4	243	469.4
183.3333	362	203.3333	398	223.3333	434	243.3333	470
183.8889	363	203.8889	399	223.8889	435	243.8889	471
184	363.2	204	399.2	224	435.2	244	471.2
184.4444	364	204.4444	400	224.4444	436	244.4444	472
185	365	205	401	225	437	245	473
185.5556 186	366 366.8	205.5556 206	402 402.8	225.5556 226	438 438.8	245.5556 246	474 474.8
186.1111	367	206.1111	403	226.1111	439	246.1111	475
186.6667	368	206.6667	404	226.6667	440	246.6667	476
187	368.6	207	404.6	227	440.6	247	476.6
187.2222	369	207.2222	405	227.2222	441	247.2222	477
187.7778	370	207.7778	406	227.7778	442	247.7778	478
188	370.4	208	406.4	228	442.4	248	478.4
188.3333	371	208.3333	407	228.3333	443	248.3333	479
188.8889	372	208.8889	408	228.8889	444	248.8889	480
189	372.2	209	408.2	229	444.2	249	480.2
189.4444	373	209.4444	409	229.4444	445	249.4444	481
190	374	210	410	230	446	250	482
190.5556 191	375 375.8	210.5556 211	411 411.8	230.5556 231	447 447.8	250.5556 251	483 483.8
191.1111	376	211.1111	412	231.1111	448	251.1111	484
191.6667	377	211.6667	413	231.6667	449	251.6667	485
192	377.6	212	413.6	232	449.6	252	485.6
192.2222	378	212.2222	414	232.2222	450	252.2222	486
192.7778	379	212.7778	415	232.7778	451	252.7778	487
193	379.4	213	415.4	233	451.4	253	487.4
193.3333	380	213.3333	416	233.3333	452	253.3333	488
193.8889	381	213.8889	417	233.8889	453	253.8889	489
194	381.2	214	417.2	234	453.2	254	489.2
194.4444	382	214.4444	418	234.4444	454	254.4444	490
195	383	215	419	235	455	255	491

Table of Thermometric Equivalents.—*Continued.*

C.°	F.°	C.°	F.°	C.°	F.°	C.°	F.°
255.5556	492	275.5556	528	295.5556	564	315.5556	600
256	492.8	276	528.8	296	564.8	316	600.8
256.1111	493	276.1111	529	296.1111	565	316.1111	601
256.6667	494	276.6667	530	296.6667	566	316.6667	602
257	494.6	277	530.6	297	566.6	317	602.6
257.2222	495	277.2222	531	297.2222	567	317.2222	603
257.7778	496	277.7778	532	297.7778	568	317.7778	604
258	496.4	278	532.4	298	568.4	318	604.4
258.3333	497	278.3333	533	298.3333	569	318.3333	605
258.8889	498	278.8889	534	298.8889	570	318.8889	606
259	498.2	279	534.2	299	570.2	319	606.2
259.4444	499	279.4444	535	299.4444	571	319.4444	607
260	500	280	536	300	572	320	608
260.5556	501	280.5556	537	300.5556	573	320.5556	609
261	501.8	281	537.8	301	573.8	321	609.8
261.1111	502	281.1111	538	301.1111	574	321.1111	610
261.6667	503	281.6667	539	301.6667	575	321.6667	611
262	503.6	282	539.6	302	575.6	322	611.6
262.2222	504	282.2222	540	302.2222	576	322.2222	612
262.7778	505	282.7778	541	302.7778	577	322.7778	613
263	505.4	283	541.4	303	577.4	323	613.4
263.3333	506	283.3333	542	303.3333	578	323.3333	614
263.8889	507	283.8889	543	303.8889	579	323.8889	615
264	507.2	284	543.2	304	579.2	324	615.2
264.4444	508	284.4444	544	304.4444	580	324.4444	616
265	509	285	545	305	581	325	617
265.5556	510	285.5556	546	305.5556	582	325.5556	618
266	510.8	286	546.8	306	582.8	326	618.8
266.1111	511	286.1111	547	306.1111	583	326.1111	619
266.6667	512	286.6667	548	306.6667	584	326.6667	620
267	512.6	287	548.6	307	584.6	327	620.6
267.2222	513	287.2222	549	307.2222	585	327.2222	621
267.7778	514	287.7778	550	307.7778	586	327.7778	622
268	514.4	288	550.4	308	586.4	328	622.4
268.3333	515	288.3333	551	308.3333	587	328.3333	623
268.8889	516	288.8889	552	308.8889	588	328.8889	624
269	516.2	289	552.2	309	588.2	329	624.2
269.4444	517	289.4444	553	309.4444	589	329.4444	625
270	518	290	554	310	590	330	626
270.5556	519	290.5556	555	310.5556	591	330.5556	627
271	519.8	291	555.8	311	591.8	331	627.8
271.1111	520	291.1111	556	311.1111	592	331.1111	628
271.6667	521	291.6667	557	311.6667	593	331.6667	629
272	521.6	292	557.6	312	593.6	332	629.6
272.2222	522	292.2222	558	312.2222	594	332.2222	630
272.7778	523	292.7778	559	312.7778	595	332.7778	631
273	523.4	293	559.4	313	595.4	333	631.4
273.3333	524	293.3333	560	313.3333	596	333.3333	632
273.8889	525	293.8889	561	313.8889	597	333.8889	633
274	525.2	294	561.2	314	597.2	334	633.2
274.4444	526	294.4444	562	314.4444	598	334.4444	634
275	527	295	563	315	599	335	635

ALCOHOL.

According to E. R. Squibb.

PART I.—From 0 to 10 per cent. of Absolute Alcohol.

Specific Gravity. (Pure water at 15½° C.=60° F. taken as unity.)		Percentage.				Weight of one gallon, at 15½° C.=60° F.								Weight of 40 gal- lons to the near- est half pound, at 15½° C.=60° F.	Weight of one pint, at 15½° C.=60° F.	
		By weight.	By volume.	Under proof. (Brit. Excise.)	Of proof spirit. (U.S. Revenue.)	In Grammes.	In Grains.	Avoirdupois Weig't.							In Grms.	In Grs.
								lbs	ozs	Grs.	To the nearest ounce.					
At 15½° C. =60° F.	At 25° C.= 77° F.											lbs.				
1.0000	0.9986					3779.13	58,320	8	5	132	8	5	333.5	472.39	7290	
0.9993	0.9978			99	1	3776.50	58,279	8	5	91	8	5	333.0	472.06	7285	
0.9985	0.9970		1	98	2	3773.46	58,232	8	5	44	8	5	332.5	471.68	7279	
0.9981	0.9966	1				3771.97	58,209	8	5	22	8	5	332.5	471.49	7276	
0.9976	0.9961			97	3	3770.08	58,180	8	4	430	8	5	332.5	471.26	7272	
0.9970	0.9953		2		4	3767.82	58,145	8	4	395	8	5	332.0	470.98	7268	
0.9968	0.9951			96		3767.04	58,133	8	4	383	8	5	332.0	470.88	7267	
0.9965	0.9948	2			5	3765.94	58,116	8	4	366	8	5	332.0	470.74	7264	
0.9960	0.9943			95		3764.06	58,087	8	4	337	8	5	332.0	470.51	7261	
0.9956	0.9938		3		6	3762.51	58,063	8	4	313	8	5	332.0	470.31	7258	
0.9952	0.9934			94		3761.02	58,040	8	4	290	8	5	331.5	470.13	7255	
0.9947	0.9927	3			7	3759.14	58,011	8	4	261	8	5	331.5	469.89	7251	
0.9944	0.9924			93		3757.97	57,993	8	4	243	8	5	331.5	469.75	7249	
0.9942	0.9922		4		8	3757.26	57,982	8	4	232	8	5	331.5	469.66	7248	
0.9936	0.9916			92	9	3754.99	57,947	8	4	197	8	4	331.0	469.37	7243	
0.9930	0.9909	4	5		10	3752.72	57,912	8	4	162	8	4	331.0	469.09	7239	
0.9921	0.9900			90	11	3749.29	57,859	8	4	109	8	4	330.5	468.66	7232	
0.9914	0.9893	5	6		12	3746.63	57,818	8	4	68	8	4	330.5	468.33	7227	
0.9906	0.9885			88	13	3743.65	57,772	8	4	22	8	4	330.0	467.95	7221	
0.9900	0.9879			87		3741.38	57,737	8	3	424	8	4	330.0	467.67	7217	
0.9898	0.9876	6	7		14	3740.60	57,725	8	3	413	8	4	330.0	467.58	7216	
0.9892	0.9870			86	15	3738.33	57,690	8	3	377	8	4	329.5	467.29	7211	
0.9890	0.9868		8		16	3737.56	57,678	8	3	366	8	4	329.5	467.19	7210	
0.9885	0.9863			85		3735.68	57,649	8	3	336	8	4	329.5	466.96	7206	
0.9884	0.9862	7			17	3735.29	57,643	8	3	331	8	4	329.5	466.91	7205	
0.9878	0.9855		9	84	18	3733.02	57,608	8	3	296	8	4	329.0	466.63	7201	
0.9872	0.9849			83	19	3730.82	57,574	8	3	261	8	4	329.0	466.35	7197	
0.9869	0.9846	8	10		20	3729.65	57,556	8	3	243	8	4	329.0	466.21	7194	
0.9864	0.9841			82	21	3727.77	57,527	8	3	214	8	3	328.5	465.97	7191	
0.9857	0.9834			81		3725.12	57,486	8	3	173	8	3	328.5	465.64	7186	
0.9855	0.9831	9	11		22	3724.34	57,474	8	3	161	8	3	328.5	465.54	7184	
0.9852	0.9828			80	23	3723.24	57,457	8	3	144	8	3	328.5	465.40	7182	
0.9845	0.9821			79		3720.58	57,416	8	3	103	8	3	328.0	465.07	7177	
0.9841	0.9816	10	12		24	3719.09	57,393	8	3	81	8	3	328.0	464.89	7174	

PART II.—From 10 to 25 per cent. of Absolute Alcohol.

Specific Gravity. (Pure water at 15 $\frac{5}{8}$ ° C.=60° F. taken as unity.)		Percentage.				Weight of one gallon, at 15 $\frac{5}{8}$ ° C.=60° F.								Weight of 40 gal- lons to the near- est half pound, at 15 $\frac{5}{8}$ ° C.=60° F.	Weight of one pint, at 15 $\frac{5}{8}$ ° C.=60° F.	
		By weight.	By volume.	Under proof. (Brit. Excise.)	Of proof spirit. (U.S. Revenue.)	In Grammes.	In Grains.	Avoirdupois Weig't.							In Grms.	In Grs.
								lbs	ozs	Grs.	To the nearest ounce.					
											lbs.	ozs				
At 15 $\frac{5}{8}$ ° C. =60° F.	At 25° C.= 77° F.															
0.9838	0.9813			78	25	3717.92	57,375	8	3	62	8	3	328.0	464.74	7172	
0.9831	0.9806			77	26	3715.27	57,334	8	3	21	8	3	327.5	464.41	7167	
0.9828	0.9801	11	13		27	3714.17	57,317	8	3	5	8	3	327.5	464.27	7165	
0.9825	0.9798			76		3713.00	57,299	8	2	424	8	3	327.5	464.13	7162	
0.9821	0.9793		14		28	3711.51	57,276	8	2	401	8	3	327.5	463.94	7159	
0.9819	0.9791			75		3710.73	57,264	8	2	389	8	3	327.0	463.84	7158	
0.9815	0.9787	12	15		29	3709.24	57,241	8	2	366	8	3	327.0	463.65	7155	
0.9813	0.9785			74	30	3708.46	57,229	8	2	354	8	3	327.0	463.56	7154	
0.9807	0.9779			73	31	3706.19	57,194	8	2	319	8	3	327.0	463.27	7149	
0.9802	0.9773	13	16	72	32	3704.32	57,165	8	2	290	8	3	326.5	463.04	7146	
0.9794	0.9765			71	33	3701.33	57,119	8	2	244	8	3	326.5	462.67	7140	
0.9789	0.9759	14	17	70	34	3699.33	57,089	8	2	214	8	2	326.0	462.42	7136	
0.9784	0.9754			69	35	3697.51	57,060	8	2	185	8	2	326.0	462.19	7132	
0.9778	0.9746	15	18	68	36	3695.24	57,025	8	2	150	8	2	326.0	461.90	7128	
0.9775	0.9743				37	3694.14	57,008	8	2	123	8	2	326.0	461.77	7126	
0.9772	0.9740			67	38	3692.97	56,990	8	2	115	8	2	325.5	461.62	7124	
0.9766	0.9733	16	19	66	39	3690.71	56,955	8	2	80	8	2	325.5	461.34	7119	
0.9760	0.9726		20	65	40	3688.44	56,920	8	2	45	8	2	325.5	461.05	7115	
0.9753	0.9719	17	21	64	41	3685.78	56,879	8	2	4	8	2	325.0	460.72	7110	
0.9749	0.9715			63	42	3684.29	56,856	8	1	418	8	2	325.0	460.54	7107	
0.9743	0.9709			62	43	3682.02	56,821	8	1	383	8	2	324.5	460.25	7103	
0.9741	0.9706	18	22		44	3681.31	56,810	8	1	373	8	2	324.5	460.16	7101	
0.9737	0.9702			61	45	3679.76	56,786	8	1	348	8	2	324.5	459.97	7098	
0.9732	0.9697			60	46	3677.88	56,757	8	1	319	8	2	324.5	459.73	7095	
0.9728	0.9692	19	23	59	47	3676.39	56,734	8	1	297	8	2	324.0	459.55	7092	
0.9720	0.9684			58	48	3673.27	56,687	8	1	249	8	2	324.0	459.16	7086	
0.9716	0.9678	20	24		49	3671.85	56,664	8	1	227	8	2	324.0	458.98	7083	
0.9714	0.9676			57	50	3671.07	56,652	8	1	214	8	1	323.5	458.88	7081	
0.9709	0.9668		25	56		3669.19	56,623	8	1	186	8	1	323.5	458.65	7078	
0.9704	0.9661	21		55	51	3667.31	56,594	8	1	157	8	1	323.5	458.41	7074	
0.9698	0.9655		26	54	52	3665.05	56,559	8	1	122	8	1	323.0	458.13	7070	
0.9693	0.9650			53		3663.17	56,530	8	1	92	8	1	323.0	457.90	7066	
0.9691	0.9646	22	27	53	54	3662.39	56,518	8	1	81	8	1	323.0	457.80	7065	
0.9683	0.9638			52	55	3659.36	56,471	8	1	33	8	1	322.5	457.42	7059	
0.9678	0.9631	23	28	51	56	3657.47	56,442	8	1	5	8	1	322.5	457.18	7055	
0.9671	0.9624			50	57	3654.81	56,401	8	0	401	8	1	322.5	456.85	7050	
0.9665	0.9617	24	29	49	58	3652.54	56,366	8	0	366	8	1	322.0	456.57	7046	
0.9658	0.9610			48	59	3649.88	56,325	8	0	325	8	1	322.0	456.24	7041	
0.9652	0.9603	25	30	47	60	3647.62	56,290	8	0	290	8	1	321.5	455.95	7036	

PART III.—From 25 to 40 per cent. of Absolute Alcohol.

Specific Gravity. (Pure water at 15 $\frac{5}{8}$ °C.=60° F. taken as unity.)		Percentage.				Weight of one gallon, at 15 $\frac{5}{8}$ ° C.=60° F.							Weight of 40 gal- lons to the near- est half pound, at 15 $\frac{5}{8}$ ° C.=60° F. lbs.	Weight of one pint, at 15 $\frac{5}{8}$ ° C.=60° F.	
		By weight.	By volume.	Under proof. (Brit. Excise.)	Of proof spirit. (U.S. Revenue.)	In Grammes.	In Grains.	Avoirdupois Weig't.						In Grms.	In Grs.
								lbs	ozs	Grs.	To the nearest ounce.				
At 15 $\frac{5}{8}$ ° C. =60° F.	At 25° C.= 77° F.										lbs.	ozs			
0.9645	0.9597			46	61	3645.02	56,250	8	0	250	8	1	321.5	455.63	7031
0.9643	0.9594		31		62	3644.24	56,238	8	0	238	8	1	321.5	455.53	7030
0.9638	0.9590	26		45	63	3642.37	56,209	8	0	209	8	0	321.0	455.30	7026
0.9631	0.9582		32	44	64	3639.71	56,168	8	0	168	8	0	321.0	454.96	7021
0.9623	0.9574	27		43	65	3636.66	56,121	8	0	121	8	0	320.5	454.58	7015
0.9618	0.9567		33	42	66	3634.79	56,092	8	0	92	8	0	320.5	454.35	7011
0.9609	0.9556	28	34	41	67	3631.42	56,040	8	0	40	8	0	320.0	453.93	7005
0.9602	0.9549			40	68	3628.76	55,999	7	15	436	8	0	320.0	453.59	7000
0.9595	0.9542			39	69	3626.10	55,958	7	15	395	8	0	320.0	453.26	6995
0.9593	0.9538	29	35		70	3625.33	55,946	7	15	383	8	0	319.5	453.17	6993
0.9587	0.9532			38	71	3623.06	55,911	7	15	348	8	0	319.5	452.88	6989
0.9578	0.9521	30	36	37	72	3619.69	55,859	7	15	296	8	0	319.0	452.46	6982
0.9572	0.9515			36	73	3617.42	55,824	7	15	261	8	0	319.0	452.18	6978
0.9565	0.9507		37	35		3614.76	55,783	7	15	220	8	0	319.0	451.84	6973
0.9560	0.9500	31			74	3612.88	55,754	7	15	191	7	15	318.5	451.61	6969
0.9555	0.9495			34	75	3611.03	55,725	7	15	162	7	15	318.5	451.38	6966
0.9550	0.9489		38	33	76	3609.12	55,696	7	15	133	7	15	318.0	451.14	6962
0.9544	0.9482	32			77	3606.86	55,661	7	15	98	7	15	318.0	450.86	6958
0.9539	0.9477			32		3604.91	55,631	7	15	68	7	15	318.0	450.61	6954
0.9535	0.9473		39		78	3603.42	55,608	7	15	45	7	15	318.0	450.43	6951
0.9528	0.9465	33		31	79	3600.76	55,567	7	15	4	7	15	317.5	450.09	6946
0.9519	0.9456		40	30	80	3597.39	55,515	7	14	390	7	15	317.0	449.67	6939
0.9511	0.9446	34		29	81	3594.35	55,468	7	14	343	7	15	317.0	449.29	6933
0.9503	0.9438		41	28	82	3591.30	55,421	7	14	296	7	15	316.5	448.91	6928
0.9495	0.9430			27	83	3588.32	55,375	7	14	250	7	15	316.5	448.54	6922
0.9490	0.9424	35	42		84	3586.44	55,346	7	14	221	7	15	316.0	448.30	6918
0.9485	0.9419			26		3584.56	55,317	7	14	192	7	14	316.0	448.07	6915
0.9475	0.9409			25	85	3580.74	55,258	7	14	133	7	14	316.0	447.59	6907
0.9470	0.9402	36	43		86	3578.86	55,229	7	14	104	7	14	315.5	447.36	6904
0.9465	0.9397			24		3576.98	55,200	7	14	75	7	14	315.5	447.12	6900
0.9455	0.9387			23	87	3573.22	55,142	7	14	17	7	14	315.0	446.65	6893
0.9452	0.9382	37	44		88	3572.06	55,124	7	13	437	7	14	315.0	446.51	6890
0.9446	0.9376			22	89	3569.79	55,089	7	13	401	7	14	315.0	446.22	6886
0.9434	0.9363	38	45	21	90	3565.25	55,019	7	13	331	7	14	314.5	445.66	6877
0.9426	0.9355			20	91	3562.21	54,972	7	13	284	7	14	314.0	445.28	6871
0.9416	0.9343	39	46	19	92	3558.45	54,914	7	13	226	7	14	314.0	444.81	6864
0.9405	0.9332			18	93	3554.30	54,850	7	13	162	7	13	313.5	444.29	6856
0.9396	0.9323	40	47	17	94	3550.87	54,797	7	13	109	7	13	313.0	443.86	6850
0.9391	0.9318				95	3548.99	54,768	7	13	75	7	13	313.0	443.62	6846

PART IV.—From 40 to 55 per cent. of Absolute Alcohol.

Specific Gravity. (Pure water at 15° C.=60° F. taken as unity.)		Percentage.				Weight of one gallon, at 15° C.=60° F.						Weight of 40 gal- lons to the near- est half pound, at 15° C.=60° F. lbs.	Weight of one pint, at 15° C.=60° F.	
At 15° C. =60° F.	At 25° C.= 77° F.	By weight.	By volume.	Under proof. (Brit. Excise.)	Of proof spirit. (U.S. Revenue)	In Grammes.	In Grains.	Avoirdupois Weig't.					In Grms.	In Grs.
								lbs	ozs	Grs.	To the nearest ounce.			
											lbs.			
0.9381	0.9307	48	16	96	3545.23	54,710	7 13 22	7 13	312.5	443.15	683			
0.9376	0.9302	41			3543.35	54,681	7 12 431	7 13	312.5	442.92	6835			
0.9373	0.9300		15	97	3542.19	54,663	7 12 413	7 13	312.5	442.77	6833			
0.9362	0.9288	49	14	98	3538.04	54,599	7 12 349	7 13	312.0	442.25	6825			
0.9356	0.9280	42			3535.77	54,564	7 12 314	7 13	312.0	441.97	6820			
0.9352	0.9276		13	99	3534.28	54,541	7 12 291	7 13	311.5	441.78	6818			
0.9343	0.9267	50	12	100	3530.84	54,488	7 12 238	7 13	311.5	441.35	6811			
0.9335	0.9259	43			3527.86	54,442	7 12 192	7 12	311.0	440.98	6805			
0.9329	0.9253		11		3525.59	54,407	7 12 157	7 12	311.0	440.70	6801			
0.9323	0.9246	51		102	3523.33	54,372	7 12 122	7 12	310.5	440.42	6796			
0.9318	0.9242		10		3521.45	54,343	7 12 93	7 12	310.5	440.18	6793			
0.9314	0.9237	44		103	3519.89	54,319	7 12 69	7 12	310.5	439.99	6790			
0.9306	0.9230		9		3516.91	54,273	7 12 23	7 12	310.0	439.61	6784			
0.9303	0.9226	52		104	3515.75	54,255	7 12 5	7 12	310.0	439.47	6782			
0.9292	0.9214	45	8	105	3511.59	54,191	7 11 379	7 12	309.5	438.95	6774			
0.9283	0.9205	53	7	106	3508.16	54,138	7 11 326	7 12	309.5	438.52	6767			
0.9270	0.9192	46	6	107	3503.30	54,063	7 11 251	7 12	309.0	437.91	6758			
0.9262	0.9184	54	5	108	3500.26	54,016	7 11 204	7 11	308.5	437.53	6752			
0.9249	0.9171	47	4	109	3495.33	53,940	7 11 128	7 11	308.0	436.92	6742			
0.9242	0.9164	55		110	3492.68	53,899	7 11 87	7 11	308.0	436.58	6737			
0.9236	0.9158		3		3490.41	53,864	7 11 51	7 11	308.0	436.30	6733			
0.9228	0.9150	48		111	3487.43	53,818	7 11 6	7 11	307.5	435.93	6727			
0.9221	0.9143	56	2	112	3484.77	53,777	7 10 402	7 11	307.5	435.60	6722			
0.9212	0.9134		1	113	3481.34	53,724	7 10 349	7 11	307.0	435.17	6715			
0.9206	0.9128	49			3479.07	53,689	7 10 314	7 11	307.0	434.88	6711			
0.9200	0.9122	57	Proof over.	114	3476.80	53,654	7 10 279	7 11	306.5	434.60	6707			
0.9189	0.9111		1	115	3472.65	53,590	7 10 215	7 10	306.0	434.08	6699			
0.9184	0.9106	50			3470.77	53,561	7 10 186	7 10	306.0	433.85	6695			
0.9178	0.9100	58	2	116	3468.51	53,526	7 10 151	7 10	306.0	433.56	6691			
0.9168	0.9090			117	3464.75	53,468	7 10 93	7 10	305.5	433.09	6684			
0.9160	0.9081	51	59	3	3461.70	53,421	7 10 46	7 10	305.0	432.71	6678			
0.9150	0.9071		4	119	3457.94	53,363	7 9 425	7 10	305.0	432.24	6670			
0.9135	0.9056	52	60	5	3452.24	53,275	7 9 338	7 10	304.5	431.53	6659			
0.9124	0.9045		6	121	3448.09	53,211	7 9 273	7 10	304.0	431.01	6651			
0.9113	0.9034	53	61	7	3443.95	53,147	7 9 210	7 9	303.5	430.49	6643			
0.9100	0.9021		8	123	3439.02	53,071	7 9 133	7 9	303.0	429.88	6634			
0.9090	0.9011	54	62	9	3435.26	53,013	7 9 76	7 9	303.0	429.41	6627			
0.9075	0.8995		10	125	3429.56	52,925	7 8 425	7 9	302.5	428.69	6616			
0.9069	0.8989	55	63	126	3427.29	52,890	7 8 390	7 9	302.0	428.41	6611			

PART V.—From 55 to 70 per cent. of Absolute Alcohol.

Specific Gravity. (Pure water at 15½° C.=60° F. taken as unity.)		Percentage.				Weight of one gallon, at 15½° C.=60° F.							Weight of 40 gal- lons to the near- est half pound, at 15½° C.=60° F. lbs.	Weight of one pint, at 15½° C.=60° F.	
		By weight.	By volume.	Over proof. (Brit. Excise.)	Of proof spirit. (U.S. Revenue.)	In Grammes.	In Grains.	Avoirdupois Weig't.						In Grms.	In Grs.
								lbs	ozs	Grs.	To the nearest ounce.	lbs.			
At 15½° C. =60° F.	At 25° C.= 77° F.														
0.9062	0.8982			11	127	3424.70	52,850	7	8	350	7	9	302.0	428.09	6606
0.9047	0.8969	56	64	12	128	3419.00	52,762	7	8	262	7	9	301.5	427.37	6593
0.9036	0.8958			13		3414.85	52,698	7	8	198	7	8	301.0	426.86	6587
0.9025	0.8947	57	65		129	3410.70	52,634	7	8	134	7	8	301.0	426.34	6579
0.9021	0.8943			14	130	3409.15	52,610	7	8	110	7	8	300.5	426.14	6576
0.9008	0.8930			15	131	3404.29	52,535	7	8	35	7	8	300.0	425.54	6567
0.9001	0.8923	58	66		132	3401.63	52,494	7	7	432	7	8	300.0	425.20	6562
0.8994	0.8916			16	133	3398.98	52,453	7	7	390	7	8	299.5	424.87	6557
0.8979	0.8901	59		17		3393.34	52,366	7	7	304	7	8	299.0	424.17	6546
0.8973	0.8895		67		134	3391.07	52,331	7	7	269	7	8	299.0	423.88	6541
0.8966	0.8888			18		3388.41	52,290	7	7	227	7	8	299.0	423.55	6536
0.8956	0.8878	60			135	3384.59	52,231	7	7	169	7	7	298.5	423.07	6529
0.8953	0.8875			19		3383.49	52,214	7	7	151	7	7	298.5	422.94	6527
0.8949	0.8870		68		136	3382.00	52,191	7	7	129	7	7	298.0	422.75	6524
0.8938	0.8859			20	137	3377.79	52,126	7	7	63	7	7	298.0	422.22	6516
0.8932	0.8853	61				3375.52	52,091	7	7	29	7	7	297.5	421.94	6511
0.8925	0.8846		69	21	138	3372.93	52,051	7	6	426	7	7	297.5	421.62	6506
0.8910	0.8831			22	139	3367.22	51,963	7	6	338	7	7	297.0	420.90	6495
0.8908	0.8829	62				3366.45	51,951	7	6	326	7	7	297.0	420.81	6494
0.8900	0.8821		70		140	3363.47	51,905	7	6	280	7	7	296.5	420.43	6488
0.8897	0.8818			23		3362.30	51,887	7	6	262	7	7	296.5	420.29	6486
0.8886	0.8807	63			141	3358.15	51,823	7	6	198	7	6	296.0	419.77	6478
0.8883	0.8804			24		3357.05	51,806	7	6	181	7	6	296.0	419.63	6476
0.8875	0.8796		71		142	3354.00	51,759	7	6	134	7	6	296.0	419.25	6470
0.8869	0.8790			25		3351.74	51,724	7	6	99	7	6	295.5	418.97	6465
0.8863	0.8784	64			143	3349.47	51,689	7	6	64	7	6	295.5	418.68	6461
0.8854	0.8775			26		3346.10	51,637	7	6	12	7	6	295.0	418.26	6455
0.8850	0.8771		72		144	3344.54	51,613	7	5	426	7	6	295.0	418.07	6452
0.8840	0.8761	65		27	145	3340.78	51,555	7	5	368	7	6	294.5	417.60	6444
0.8825	0.8746		73	28	146	3335.08	51,467	7	5	279	7	6	294.0	416.88	6433
0.8816	0.8736	66				3331.71	51,415	7	5	228	7	6	294.0	416.46	6427
0.8811	0.8731			29	147	3329.83	51,386	7	5	198	7	5	293.5	416.23	6423
0.8799	0.8719		74	30	148	3325.30	51,316	7	5	129	7	5	293.0	415.66	6414
0.8793	0.8713	67			149	3323.03	51,281	7	5	94	7	5	293.0	415.38	6410
0.8783	0.8703			31		3319.21	51,222	7	5	34	7	5	292.5	414.90	6403
0.8769	0.8689	68	75	32	150	3313.96	51,141	7	4	391	7	5	292.0	414.25	6393
0.8754	0.8674			33	151	3308.25	51,053	7	4	303	7	5	291.5	413.53	6382
0.8745	0.8665	69	76		152	3304.89	51,001	7	4	251	7	5	291.5	413.11	6375
0.8739	0.8659			34	153	3302.62	50,966	7	4	216	7	4	291.0	412.83	6371
0.8721	0.8641	70	77	35	154	3295.81	50,861	7	4	111	7	4	290.5	411.98	6358

PART VI.—From 70 to 85 per cent. of Absolute Alcohol.

Specific Gravity. (Pure water at 15 ⁵ ° C.=60° F. taken as unity.)		Percentage.				Weight of one gallon, at 15 ⁵ ° C.=60° F.								Weight of 40 gal- lons to the near- est half pound, at 15 ⁵ ° C.=60° F. lbs.	Weight of one pint, at 15 ⁵ ° C.=60° F.	
		By weight.	By volume.	Over proof. (Brit. Excise.)	Of proof spirit. (U.S. Revenue.)	In Grammes.	In Grains.	Avoirdupois Weig't.					In Grms.		In Grs.	
								lbs	ozs	Grs.	To the nearest ounce.					
At 15 ⁵ ° C. =60° F.	At 25° C.= 77° F.										lbs.	ozs				
0.8708	0.8628			36	155	3290.89	50,785	7	4	35	7	4	290.0	411.36	6348	
0.8696	0.8616	71	78	37		3286.35	50,715	7	3	403	7	4	290.0	410.79	6339	
0.8693	0.8613				156	3285.25	50,698	7	3	385	7	4	289.5	410.66	6337	
0.8678	0.8598			38	157	3279.55	50,610	7	3	297	7	4	289.0	409.94	6326	
0.8672	0.8591	72			158	3277.28	50,575	7	3	263	7	4	289.0	409.66	6322	
0.8664	0.8583		79	39		3274.23	50,528	7	3	216	7	3	288.5	409.28	6316	
0.8649	0.8568	73			159	3268.59	50,441	7	3	129	7	3	288.0	408.57	6305	
0.8646	0.8565			40		3267.43	50,423	7	3	110	7	3	288.0	408.43	6303	
0.8639	0.8558		80		160	3264.84	50,383	7	3	71	7	3	288.0	408.10	6298	
0.8631	0.8550			41		3261.79	50,336	7	3	23	7	3	287.5	407.72	6292	
0.8625	0.8544	74				3259.53	50,301	7	2	426	7	3	287.5	407.44	6288	
0.8615	0.8534			42	161	3255.77	50,243	7	2	368	7	3	287.0	406.97	6280	
0.8611	0.8530		81		162	3254.21	50,219	7	2	344	7	3	287.0	406.78	6277	
0.8603	0.8522	75			163	3251.23	50,173	7	2	298	7	3	286.5	406.40	6272	
0.8599	0.8518			43		3249.68	50,149	7	2	274	7	3	286.5	406.21	6269	
0.8581	0.8500	76	82	44	164	3242.87	50,044	7	2	169	7	2	286.0	405.36	6255	
0.8566	0.8485			45	165	3237.23	49,957	7	2	82	7	2	285.5	404.65	6245	
0.8557	0.8476	77	83			3233.80	49,904	7	2	29	7	2	285.0	404.22	6238	
0.8550	0.8469			46	166	3231.21	49,864	7	1	426	7	2	285.0	403.90	6233	
0.8539	0.8458				167	3227.00	49,799	7	1	361	7	2	284.5	403.38	6225	
0.8533	0.8452	78		47		3224.73	49,764	7	1	327	7	2	284.5	403.09	6220	
0.8526	0.8444		84		168	3222.14	49,724	7	1	287	7	2	284.0	402.77	6215	
0.8516	0.8434			48		3218.31	49,665	7	1	227	7	2	284.0	402.29	6208	
0.8508	0.8426	79			169	3215.33	49,619	7	1	182	7	1	283.5	401.92	6202	
0.8501	0.8419			49	170	3212.67	49,578	7	1	140	7	1	283.5	401.58	6197	
0.8496	0.8414		85			3210.79	49,549	7	1	112	7	1	283.0	401.35	6194	
0.8483	0.8401	80		50	171	3205.87	49,473	7	1	36	7	1	282.5	400.73	6184	
0.8466	0.8384		86	51	172	3199.46	49,374	7	0	374	7	1	282.0	399.93	6172	
0.8459	0.8377	81				3196.80	49,333	7	0	333	7	1	282.0	399.60	6167	
0.8450	0.8368			52	173	3193.36	49,280	7	0	280	7	1	281.5	399.17	6160	
0.8434	0.8352	82	87	53	174	3187.34	49,187	7	0	187	7	0	281.0	398.42	6148	
0.8415	0.8333			54	175	3180.15	49,076	7	0	76	7	0	280.5	397.52	6134	
0.8408	0.8326	83	88			3177.49	49,035	7	0	35	7	0	280.0	397.19	6129	
0.8396	0.8314			55	176	3172.95	48,965	6	15	402	7	0	280.0	396.62	6121	
0.8387	0.8305				177	3169.58	48,913	6	15	350	7	0	279.5	396.20	6114	
0.8382	0.8300	84				3167.70	48,884	6	15	322	7	0	279.5	395.96	6110	
0.8376	0.8294			56		3165.44	48,849	6	15	286	7	0	279.0	395.68	6106	
0.8373	0.8291		89		178	3164.27	48,831	6	15	269	7	0	279.0	395.53	6104	

PART VII.—From 85 to 100 per cent. of Absolute Alcohol.

Specific Gravity. (Pure water at 15 $\frac{5}{8}$ ° C.=60° F. taken as unity.)		Percentage.				Weight of one gallon, at 15 $\frac{5}{8}$ ° C.=60° F.								Weight of 40 gal- lons to the near- est half pound, at 15 $\frac{5}{8}$ ° C.=60° F.	Weight of one pint, at 15 $\frac{5}{8}$ ° C.=60° F.	
		By weight.	By volume.	Over proof. (Brit. Excise.)	Of proof spirit. (U.S. Revenue.)	In Grammes.	In Grains.	Avoirdupois Weig't.							In Grms.	In Grs.
								lbs	ozs	Grs.	To the nearest ounce.					
At 15 $\frac{5}{8}$ ° C. =60° F.	At 25° C.= 77° F.												lbs.			
0.8357	0.8275	85		57	179	3158.24	48,738	6	15	176	6	15	278.5	394.78	6092	
0.8340	0.8258		90		180	3151.83	48,639	6	15	77	6	15	278.0	393.98	6080	
0.8336	0.8254			58		3150.34	48,616	6	15	53	6	15	278.0	393.79	6077	
0.8331	0.8249	86				3148.39	48,586	6	15	24	6	15	277.5	393.55	6073	
0.8317	0.8235			59	181	3143.14	48,505	6	14	380	6	15	277.0	392.89	6063	
0.8305	0.8223	87	91		182	3138.61	48,435	6	14	310	6	15	277.0	392.33	6054	
0.8298	0.8216			60		3135.95	48,394	6	14	269	6	15	276.5	391.99	6049	
0.8288	0.8206				183	3132.19	48,336	6	14	211	6	14	276.0	391.52	6042	
0.8279	0.8197	88		61		3128.76	48,283	6	14	158	6	14	276.0	391.09	6035	
0.8272	0.8191		92		184	3126.10	48,242	6	14	117	6	14	275.5	390.76	6030	
0.8259	0.8178			62		3121.15	48,166	6	14	41	6	14	275.0	390.14	6021	
0.8254	0.8173	89			185	3119.30	48,137	6	14	12	6	14	275.0	389.91	6017	
0.8240	0.8159			63		3114.05	48,056	6	13	368	6	14	274.5	389.26	6007	
0.8237	0.8156		93		186	3112.88	48,038	6	13	351	6	14	274.5	389.11	6005	
0.8228	0.8147	90				3109.51	47,986	6	13	299	6	14	274.0	388.69	5998	
0.8221	0.8140			64	187	3106.86	47,945	6	13	257	6	14	274.0	388.36	5993	
0.8199	0.8118	91	94	65	188	3098.56	47,817	6	13	130	6	13	273.0	387.32	5977	
0.8176	0.8095			66	189	3089.81	47,682	6	12	432	6	13	272.5	386.23	5960	
0.8172	0.8091	92				3088.32	47,659	6	12	409	6	13	272.5	386.04	5957	
0.8164	0.8083		95		190	3085.28	47,612	6	12	362	6	13	272.0	385.66	5951	
0.8156	0.8075			67		3082.30	47,566	6	12	316	6	13	272.0	385.29	5946	
0.8145	0.8064	93				3078.15	47,502	6	12	252	6	13	271.5	384.77	5938	
0.8139	0.8058				191	3075.88	47,467	6	12	217	6	12	271.0	384.48	5933	
0.8134	0.8053			68		3073.94	47,437	6	12	187	6	12	271.0	384.24	5930	
0.8125	0.8044		96			3070.57	47,385	6	12	135	6	12	271.0	383.82	5923	
0.8118	0.8037	94			192	3067.91	47,344	6	12	94	6	12	270.5	383.49	5918	
0.8112	0.8031			69		3065.64	47,309	6	12	59	6	12	270.5	383.20	5914	
0.8098	0.8017				193	3060.39	47,228	6	11	415	6	12	270.0	382.55	5903	
0.8090	0.8009			70		3057.35	47,181	6	11	368	6	12	269.5	382.17	5898	
0.8089	0.8008	95				3056.96	47,175	6	11	363	6	12	269.5	382.12	5897	
0.8084	0.8003		97		194	3055.08	47,146	6	11	334	6	12	269.5	381.88	5893	
0.8061	0.7980	96			195	3046.33	47,011	6	11	200	6	11	268.5	380.79	5876	
0.8041	0.7960		98		196	3038.82	46,895	6	11	83	6	11	268.0	379.85	5862	
0.8031	0.7950	97				3035.06	46,837	6	11	25	6	11	267.5	379.38	5855	
0.8014	0.7933				197	3028.64	46,738	6	10	363	6	11	267.0	378.58	5842	
0.8001	0.7920	98				3023.72	46,662	6	10	287	6	11	266.5	377.96	5833	
0.7995	0.7914		99			3021.45	46,627	6	10	252	6	11	266.5	377.68	5828	
0.7992	0.7911				198	3020.28	46,609	6	10	234	6	11	266.5	377.53	5826	
0.7969	0.7888	99			199	3011.59	46,475	6	10	100	6	10	265.5	376.45	5809	
0.7946	0.7865		100		200	3002.92	46,341	6	9	404	6	10	265.0	375.37	5793	
0.7938	0.7858	100				2999.87	46,294	6	9	357	6	10	264.5	374.98	5787	

ACETIC ACID. According to Oudemans.

Percent. of absolute Acetic Acid.	SPECIFIC GRAVITY			Percent. of absolute Acetic Acid.	SPECIFIC GRAVITY			Percent. of absolute Acetic Acid.	SPECIFIC GRAVITY		
	at 0°C.	at 15°C.	at 40°C.		at 0°C.	at 15°C.	at 40°C.		at 0°C.	at 15°C.	at 40°C.
1	1.0016	1.0007	0.9936	34	1.0547	1.0459	1.0291	67	1.0856	1.0721	1.0488
2	1.0033	1.0022	0.9948	35	1.0560	1.0470	1.0300	68	1.0861	1.0725	1.0491
3	1.0051	1.0037	0.9960	36	1.0573	1.0481	1.0308	69	1.0866	1.0729	1.0493
4	1.0069	1.0052	0.9972	37	1.0585	1.0492	1.0316	70	1.0871	1.0733	1.0495
5	1.0088	1.0067	0.9984	38	1.0598	1.0502	1.0324	71	1.0875	1.0737	1.0497
6	1.0106	1.0083	0.9996	39	1.0610	1.0513	1.0332	72	1.0879	1.0740	1.0498
7	1.0124	1.0098	1.0008	40	1.0622	1.0523	1.0340	73	1.0883	1.0742	1.0499
8	1.0142	1.0113	1.0020	41	1.0634	1.0533	1.0348	74	1.0886	1.0744	1.0500
9	1.0159	1.0127	1.0032	42	1.0646	1.0543	1.0355	75	1.0888	1.0746	1.0501
10	1.0176	1.0142	1.0044	43	1.0657	1.0552	1.0363	76	1.0891	1.0747	1.0501
11	1.0194	1.0157	1.0056	44	1.0668	1.0562	1.0370	77	1.0893	1.0748	1.0501
12	1.0211	1.0171	1.0067	45	1.0679	1.0571	1.0377	78	1.0894	1.0748	1.0500
13	1.0228	1.0185	1.0079	46	1.0690	1.0580	1.0384	79	1.0896	1.0748	1.0499
14	1.0245	1.0200	1.0090	47	1.0700	1.0589	1.0391	80	1.0897	1.0748	1.0497
15	1.0262	1.0214	1.0101	48	1.0710	1.0598	1.0397	81	1.0897	1.0747	1.0495
16	1.0279	1.0228	1.0112	49	1.0720	1.0607	1.0404	82	1.0897	1.0746	1.0492
17	1.0295	1.0242	1.0123	50	1.0730	1.0615	1.0410	83	1.0896	1.0744	1.0489
18	1.0311	1.0256	1.0134	51	1.0740	1.0623	1.0416	84	1.0894	1.0742	1.0485
19	1.0327	1.0270	1.0144	52	1.0749	1.0631	1.0423	85	1.0892	1.0739	1.0481
20	1.0343	1.0284	1.0155	53	1.0758	1.0638	1.0429	86	1.0889	1.0736	1.0475
21	1.0359	1.0298	1.0166	54	1.0767	1.0646	1.0434	87	1.0885	1.0731	1.0469
22	1.0374	1.0311	1.0176	55	1.0775	1.0653	1.0440	88	1.0881	1.0726	1.0462
23	1.0390	1.0324	1.0187	56	1.0783	1.0660	1.0445	89	1.0876	1.0720	1.0455
24	1.0405	1.0337	1.0197	57	1.0791	1.0666	1.0450	90	1.0871	1.0713	1.0447
25	1.0420	1.0350	1.0207	58	1.0798	1.0673	1.0455	91	....	1.0705	1.0438
26	1.0435	1.0363	1.0217	59	1.0806	1.0679	1.0460	92	....	1.0696	1.0428
27	1.0450	1.0375	1.0227	60	1.0813	1.0685	1.0464	93	....	1.0686	1.0416
28	1.0465	1.0388	1.0236	61	1.0820	1.0691	1.0468	94	....	1.0674	1.0403
29	1.0479	1.0400	1.0246	62	1.0826	1.0697	1.0472	95	....	1.0660	1.0388
30	1.0493	1.0412	1.0255	63	1.0832	1.0702	1.0475	96	....	1.0644	1.0370
31	1.0507	1.0424	1.0264	64	1.0838	1.0707	1.0479	97	....	1.0625	1.0350
32	1.0520	1.0436	1.0274	65	1.0845	1.0712	1.0482	98	....	1.0604	1.0327
33	1.0534	1.0447	1.0283	66	1.0851	1.0717	1.0485	99	....	1.0580	1.0301

HYDROBROMIC ACID. According to Biel.

Percent. HBr.	Specific Gravity at 15° C. (59° F.)	Percent. HBr.	Specific Gravity at 15° C. (59° F.)	Percent. HBr.	Specific Gravity at 15° C. (59° F.)	Percent. HBr.	Specific Gravity at 15° C. (59° F.)
1	1.0082	14	1.110	27	1.229	40	1.375
2	1.0155	15	1.119	28	1.239	41	1.388
3	1.0230	16	1.127	29	1.249	42	1.401
4	1.0305	17	1.136	30	1.260	43	1.415
5	1.038	18	1.145	31	1.270	44	1.429
6	1.046	19	1.154	32	1.281	45	1.444
7	1.053	20	1.163	33	1.292	46	1.459
8	1.061	21	1.172	34	1.303	47	1.474
9	1.069	22	1.181	35	1.314	48	1.490
10	1.077	23	1.190	36	1.326	49	1.496
11	1.085	24	1.200	37	1.338	50	1.513
12	1.093	25	1.209	38	1.350		
13	1.102	26	1.219	39	1.362		

HYDROCHLORIC ACID.

According to G. Lunge and L. Marchlewski.

Specific Gravity at $\frac{15^{\circ}\text{C.}}{4^{\circ}\text{C.}}$ in vacuo.	Specific Gravity at $\frac{15^{\circ}\text{C.}}{15^{\circ}\text{C.}}$ in air.	100 Parts by weight contain ... Parts of HCl.	1 Liter contains ... Kilos of HCl.	Specific Gravity at $\frac{15^{\circ}\text{C.}}{4^{\circ}\text{C.}}$ in vacuo.	Specific Gravity at $\frac{15^{\circ}\text{C.}}{15^{\circ}\text{C.}}$ in air.	100 Parts by weight contain ... Parts of HCl.	1 Liter contains ... Kilos of HCl.
1.000	1.0008	0.16	0.0016	1.105	1.106	20.97	0.232
1.005	1.00059	1.15	0.012	1.110	1.111	21.92	0.243
1.010	1.00109	2.14	0.022	1.115	1.116	22.86	0.255
1.015	1.0159	3.12	0.032	1.120	1.121	23.82	0.267
1.020	1.021	4.13	0.042	1.125	1.126	24.78	0.278
....	1.0253	5.	....	....	1.1271	25.	....
1.025	1.026	5.15	0.053	1.130	1.131	25.75	0.291
1.030	1.031	6.15	0.064	1.135	1.136	26.70	0.303
1.035	1.036	7.15	0.074	1.140	1.141	27.66	0.315
1.040	1.041	8.16	0.085	1.145	1.146	28.61	0.328
1.045	1.046	9.16	0.096	1.150	1.151	29.57	0.340
....	1.0502	10.	....	....	1.1532	30.	....
1.050	1.051	10.17	0.107	1.155	1.156	30.55	0.353
1.055	1.056	11.18	0.118	....	1.160	31.326	.....
1.060	1.061	12.19	0.129	1.160	1.161	31.52	0.366
1.065	1.066	13.19	0.141	....	1.163	31.90	....
1.070	1.071	14.17	0.152	1.165	1.166	32.49	0.379
....	1.0752	15.	....	1.170	1.171	33.46	0.392
1.075	1.076	15.16	0.163	1.175	1.176	34.42	0.404
1.080	1.081	16.15	0.174	....	1.179	35.	....
1.085	1.086	17.13	0.186	1.180	1.181	35.39	0.418
1.090	1.091	18.11	0.197	1.185	1.186	36.31	0.430
1.095	1.096	19.06	0.209	1.190	1.191	37.23	0.443
....	1.1005	20.	....	1.195	1.196	38.16	0.456
1.100	1.101	20.01	0.220	1.200	1.201	39.11	0.469

NOTE.—The second vertical column, and the specific gravities corresponding to whole numbers of percentages by weight ending in 5 or 0, and also to 31.326 and to 31.90 per cent., were added by the Committee of Revision.

It is to be understood that the values given in this table, as well as those given for nitric and sulphuric acids, refer only to chemically pure acids. The percentage of real acid in the commercial acids, particularly when they are concentrated, is always less than that given in these tables. [Lunge.]

EXPLANATORY NOTE.—When the specific gravity of a liquid is given, it is necessary to state not only the temperature of the liquid, but also that of the standard (water) with which it is compared. These two values, particularly where space is to be saved, are now usually given in the form of a fraction, the upper figure representing the temperature of the liquid in question, while the lower figure represents the temperature of the standard (water). Thus, $\frac{15^{\circ}\text{C.}}{4^{\circ}\text{C.}}$ denotes that the specific gravity of the liquid, for instance, of hydrochloric acid, is given for the temperature of 15°C. , as compared with water at 4°C.

NITRIC ACID.

According to G. Lunge and H. Rey.

Specific Gravity at 15° C. in vacuo.	Specific Gravity at 15° C. in air.	100 Parts contain ... Parts of		1 Liter contains ... Kilos of		Specific Gravity at 15° C. in vacuo.	Specific Gravity at 15° C. in air.	100 Parts contain ... Parts of		1 Liter contains ... Kilos of	
		N ₂ O ₅ .	HNO ₃ .	N ₂ O ₅ .	HNO ₃ .			N ₂ O ₅ .	HNO ₃ .	N ₂ O ₅ .	HNO ₃ .
1.000	1.0001	0.08	0.10	0.001	0.001	1.185	1.186	25.83	30.13	0.306	0.357
1.005	1.0059	0.85	1.00	0.008	0.010	1.190	1.191	26.47	30.88	0.315	0.367
1.010	1.0109	1.62	1.90	0.016	0.019	1.195	1.196	27.10	31.62	0.324	0.378
1.015	1.0159	2.39	2.80	0.024	0.028	1.200	1.201	27.74	32.36	0.333	0.388
1.020	1.021	3.17	3.70	0.033	0.038	1.205	1.206	28.36	33.09	0.342	0.399
1.025	1.026	3.94	4.60	0.040	0.047	1.210	1.211	28.99	33.82	0.351	0.409
....	1.028	....	5.	....	....	1.215	1.216	29.61	34.55	0.360	0.420
1.030	1.031	4.71	5.50	0.049	0.057	....	1.219	30.	35.	....	....
....	1.033	5.	....	....	....	1.220	1.221	30.24	35.28	0.369	0.430
1.035	1.036	5.47	6.38	0.057	0.066	1.225	1.226	30.88	36.03	0.378	0.441
1.040	1.041	6.22	7.26	0.064	0.075	1.230	1.231	31.53	36.78	0.387	0.452
1.045	1.046	6.97	8.13	0.073	0.085	1.235	1.236	32.17	37.53	0.397	0.463
1.050	1.051	7.71	8.99	0.081	0.094	1.240	1.241	32.82	38.29	0.407	0.475
1.055	1.056	8.43	9.84	0.089	0.104	1.245	1.246	33.47	39.05	0.417	0.486
....	1.057	....	10.	....	....	1.250	1.251	34.13	39.82	0.427	0.498
1.060	1.061	9.15	10.68	0.097	0.113	....	1.252	....	40.	....	....
1.065	1.066	9.87	11.51	0.105	0.123	1.255	1.256	34.78	40.58	0.437	0.509
....	1.067	10.	....	....	....	....	1.258	35.	....	....	....
1.070	1.071	10.57	12.33	0.113	0.132	1.260	1.261	35.44	41.34	0.447	0.521
1.075	1.076	11.27	13.15	0.121	0.141	1.265	1.266	36.09	42.10	0.457	0.533
1.080	1.081	11.96	13.95	0.129	0.151	1.270	1.271	36.75	42.87	0.467	0.544
1.085	1.086	12.64	14.74	0.137	0.160	1.275	1.276	37.41	43.64	0.477	0.556
....	1.088	....	15.	....	....	1.280	1.281	38.07	44.41	0.487	0.568
1.090	1.091	13.31	15.53	0.145	0.169	....	1.285	....	45.	....	....
1.095	1.096	13.99	16.32	0.153	0.179	1.285	1.286	38.73	45.18	0.498	0.581
1.100	1.101	14.67	17.11	0.161	0.188	1.290	1.291	39.39	45.95	0.508	0.593
....	1.103	15.	....	....	....	....	1.2957	40.	....	....	....
1.105	1.106	15.34	17.89	0.170	0.198	1.295	1.296	40.05	46.72	0.519	0.608
1.110	1.111	16.00	18.69	0.177	0.207	1.300	1.301	40.71	47.49	0.529	0.617
1.115	1.116	16.67	19.45	0.186	0.217	1.305	1.306	41.37	48.26	0.540	0.630
....	1.1195	....	20.	....	....	1.310	1.311	42.06	49.07	0.551	0.643
1.120	1.121	17.34	20.23	0.195	0.227	1.315	1.316	42.76	49.89	0.562	0.656
1.125	1.126	18.00	21.00	0.202	0.236	....	1.317	....	50.	....	....
1.130	1.131	18.66	21.77	0.211	0.246	1.320	1.3215	43.47	50.71	0.573	0.669
1.135	1.136	19.32	22.54	0.219	0.256	1.325	1.327	44.67	51.53	0.585	0.683
1.140	1.141	19.98	23.31	0.228	0.266	1.330	1.332	44.89	52.37	0.597	0.697
....	1.1412	20.	....	....	....	....	1.333	45.	....	....	....
1.145	1.146	20.64	24.08	0.237	0.276	1.335	1.337	45.62	53.22	0.609	0.710
1.150	1.151	21.29	24.84	0.245	0.286	1.340	1.342	46.35	54.07	0.621	0.725
....	1.152	....	25.	....	....	1.345	1.347	47.08	54.93	0.633	0.739
1.155	1.156	21.94	25.60	0.254	0.296	....	1.3474	....	55.	....	....
1.160	1.161	22.60	26.36	0.262	0.306	1.350	1.352	47.82	55.79	0.645	0.753
1.165	1.166	23.25	27.12	0.271	0.316	1.355	1.357	48.57	56.66	0.658	0.768
1.170	1.171	23.90	27.88	0.279	0.326	1.360	1.362	49.35	57.57	0.671	0.783
1.175	1.176	25.54	28.63	0.288	0.336	....	1.366	50.	....	....	....
....	1.180	25.	....	....	....	1.365	1.367	50.13	58.48	0.684	0.798
1.180	1.181	25.18	29.38	0.297	0.347	1.370	1.372	50.91	59.39	0.698	0.814
....	1.185	....	30.	....	....	....	1.375	....	60.	....	....

Nitric Acid.—*Continued.*

Specific Gravity at 15° C. in vacuo.	Specific Gravity at 15° C. in air.	100 Parts contain ... Parts of		1 Liter contains ... Kilos of		Specific Gravity at 15° C. in vacuo.	Specific Gravity at 15° C. in air.	100 Parts contain ... Parts of		1 Liter contains ... Kilos of	
		N ₂ O ₅ .	HNO ₃ .	N ₂ O ₅ .	HNO ₃ .			N ₂ O ₅ .	HNO ₃ .	N ₂ O ₅ .	HNO ₃ .
1.375	1.377	51.69	60.30	0.711	0.829	1.480	1.482	73.76	86.05	1.092	1.274
1.380	1.382	52.52	61.27	0.725	0.846	1.485	1.487	75.18	87.70	1.116	1.302
1.385	1.387	53.35	62.24	0.739	0.862	1.490	1.492	76.80	89.60	1.144	1.335
1.390	1.392	54.20	63.23	0.753	0.879	....	1.493	....	90.	....	....
....	1.3996	55.	....	....	....	1.495	1.497	78.52	91.60	1.174	1.369
1.395	1.397	55.07	64.25	0.768	0.896	....	1.5005	80.	....	....	....
....	1.401	....	65.	....	....	1.500	1.502	80.65	94.09	1.210	1.411
1.400	1.402	55.97	65.30	0.783	0.914	1.501	1.503	81.09	94.60	1.217	1.420
1.405	1.407	56.92	66.40	0.800	0.933	....	1.5038	....	95.	....	....
1.410	1.412	57.86	67.50	0.816	0.952	1.502	1.504	81.50	95.08	1.224	1.428
....	1.414	....	68.	....	....	1.503	1.505	81.91	95.55	1.231	1.436
1.415	1.417	58.83	68.63	0.832	0.971	1.504	1.506	82.29	96.00	1.238	1.444
1.420	1.422	59.83	69.80	0.849	0.991	1.505	1.507	82.63	96.39	1.244	1.451
....	1.4228	60.	70.	....	....	1.506	1.508	82.94	96.76	1.249	1.457
1.425	1.427	60.84	70.98	0.867	1.011	1.507	1.509	83.26	97.13	1.255	1.464
1.430	1.432	61.86	72.17	0.885	1.032	1.508	1.510	83.58	97.50	1.260	1.470
1.435	1.437	62.91	73.39	0.903	1.053	1.509	1.511	83.87	97.84	1.265	1.476
1.440	1.442	64.01	74.68	0.921	1.075	1.510	1.512	84.09	98.10	1.270	1.480
....	1.443	....	75.	....	....	1.511	1.513	84.21	98.32	1.274	1.486
....	1.446	65.	....	....	....	1.512	1.514	84.46	98.53	1.277	1.490
1.445	1.447	65.13	75.98	0.941	1.098	1.513	1.515	84.63	98.73	1.280	1.494
1.450	1.452	66.24	77.28	0.961	1.121	1.514	1.516	84.78	98.90	1.283	1.497
1.455	1.457	67.38	78.60	0.981	1.144	1.515	1.517	84.92	99.07	1.287	1.501
1.460	1.462	68.56	79.98	1.001	1.168	....	1.5177	85.	....	....	....
....	1.4655	....	80.	....	....	1.516	1.518	85.04	99.21	1.289	1.504
1.465	1.467	69.79	81.42	1.023	1.193	1.517	1.519	85.15	99.34	1.292	1.507
1.470	1.472	71.06	82.90	1.045	1.219	1.518	1.520	85.26	99.46	1.294	1.510
1.475	1.477	72.39	84.45	1.068	1.246	1.519	1.521	85.35	99.57	1.296	1.512
....	1.479	....	85.	....	....	1.520	1.522	85.44	99.67	1.299	1.515

NOTE.—The second vertical column, and the specific gravities corresponding to whole numbers of percentages by weight ending in 5 or 0, were added by the Committee of Revision.

See also Note to Table of Hydrochloric Acid, page 539.

PHOSPHORIC ACID.

According to A. B. Lyons.

Specific Gravity 15° C. at 4° C. in vacuo.	Specific Gravity 15° C. at 15° C. in air.	Percentage of		Specific Gravity 15° C. at 4° C. in vacuo.	Specific Gravity 15° C. at 15° C. in air.	Percentage of	
		P ₂ O ₅ .	H ₃ PO ₄ .			P ₂ O ₅ .	H ₃ PO ₄ .
0.9991	1.0000	0.0	0	1.2871	1.2885	31.153	43
1.0048	1.0056	0.725	1	1.2953	1.2967	31.878	44
1.0104	1.0113	1.449	2	1.3036	1.3050	32.602	45
1.0161	1.0170	2.174	3	1.3119	1.3134	33.327	46
1.0118	1.0226	2.808	4	1.3201	1.3219	34.051	47
1.0274	1.0283	3.623	5	1.3290	1.3304	34.776	48
1.0331	1.0340	4.347	6	1.3376	1.3391	35.500	49
1.0389	1.0398	5.072	7	1.3464	1.3479	36.225	50
1.0448	1.0457	5.796	8	1.3553	1.3568	36.949	51
1.0507	1.0517	6.521	9	1.3642	1.3657	37.674	52
1.0567	1.0577	7.245	10	1.3732	1.3748	38.398	53
1.0628	1.0637	7.970	11	1.3824	1.3840	39.123	54
1.0688	1.0698	8.094	12	1.3916	1.3932	39.847	55
1.0749	1.0759	9.419	13	1.4010	1.4026	40.562	56
1.0811	1.0821	10.143	14	1.4104	1.4120	41.286	57
1.0872	1.0882	10.868	15	1.4199	1.4215	42.021	58
1.0934	1.0945	11.592	16	1.4295	1.4312	42.745	59
1.0998	1.1008	12.317	17	1.4393	1.4409	43.470	60
1.1061	1.1072	13.041	18	1.4491	1.4508	44.194	61
1.1125	1.1136	13.766	19	1.4590	1.4607	44.919	62
1.1190	1.1201	14.490	20	1.4690	1.4706	45.643	63
1.1255	1.1266	15.215	21	1.4790	1.4807	46.368	64
1.1321	1.1332	15.939	22	1.4890	1.4908	47.092	65
1.1388	1.1399	16.664	23	1.4992	1.5010	47.817	66
1.1455	1.1467	17.388	24	1.5097	1.5113	48.541	67
1.1524	1.1535	18.113	25	1.5198	1.5216	49.266	68
1.1593	1.1604	18.837	26	1.5302	1.5321	49.990	69
1.1662	1.1674	19.562	27	1.5407	1.5426	50.714	70
1.1733	1.1745	20.286	28	1.5513	1.5532	51.439	71
1.1804	1.1816	21.011	29	1.5619	1.5638	52.163	72
1.1877	1.1889	21.735	30	1.5726	1.5746	52.888	73
1.1950	1.1962	22.460	31	1.5834	1.5854	53.612	74
1.2023	1.2035	23.184	32	1.5943	1.5963	54.337	75
1.2097	1.2110	23.909	33	1.6053	1.6073	55.061	76
1.2172	1.2184	24.633	34	1.6172	1.6193	55.786	77
1.2247	1.2260	25.358	35	1.6284	1.6304	56.510	78
1.2323	1.2336	26.082	36	1.6396	1.6416	57.235	79
1.2399	1.2412	26.807	37	1.6509	1.6529	57.959	80
1.2476	1.2489	27.531	38	1.6621	1.6642	58.684	81
1.2554	1.2567	28.256	39	1.6734	1.6756	59.408	82
1.2632	1.2645	28.980	40	1.6849	1.6871	60.133	83
1.2711	1.2724	29.704	41	1.6964	1.6986	60.857	84
1.2791	1.2804	30.429	42	1.7080	1.7102	61.582	85

SULPHURIC ACID.

According to G. Lunge and M. Isler.

Specific Gravity 15° C. at 4° C. in vacuo.	Specific Gravity 15° C. at 15° C. in air.	100 Parts contain ... Parts of		1 Liter contains ... Kilos of		Specific Gravity 15° C. at 4° C. in vacuo.	Specific Gravity 15° C. at 15° C. in air.	100 Parts contain ... Parts of		1 Liter contains ... Kilos of	
		SO ₃ .	H ₂ SO ₄ .	SO ₃ .	H ₂ SO ₄ .			SO ₃ .	H ₂ SO ₄ .	SO ₃ .	H ₂ SO ₄ .
1.000	1.0008	0.07	0.09	0.001	0.001	1.195	1.196	21.78	26.68	0.260	0.319
1.005	1.0059	0.68	0.83	0.007	0.008	1.200	1.201	22.30	27.32	0.268	0.328
1.010	1.0109	1.28	1.57	0.013	0.016	1.205	1.206	22.82	27.95	0.275	0.337
1.015	1.0159	1.88	2.30	0.019	0.023	1.210	1.211	23.33	28.58	0.280	0.346
1.020	1.021	2.47	3.03	0.025	0.031	1.215	1.216	23.84	29.21	0.290	0.355
1.025	1.026	3.07	3.76	0.032	0.039	1.220	1.221	24.36	29.84	0.297	0.364
1.030	1.031	3.67	4.49	0.038	0.046	....	1.222	....	30.	....	....
....	1.0345	....	5.	....	....	1.225	1.226	24.88	30.48	0.305	0.373
1.035	1.036	4.27	5.23	0.044	0.054	....	1.227	25.	....	....	....
1.040	1.041	4.87	5.96	0.051	0.062	1.230	1.231	25.39	31.11	0.312	0.382
....	1.042	5.	....	....	....	1.235	1.236	25.88	31.70	0.320	0.391
1.045	1.046	5.45	6.67	0.057	0.071	1.240	1.241	26.35	32.28	0.327	0.400
1.050	1.051	6.02	7.37	0.063	0.077	1.245	1.246	26.83	32.86	0.334	0.409
1.055	1.056	6.59	8.07	0.070	0.085	1.250	1.251	27.29	33.43	0.341	0.418
1.060	1.061	7.16	8.77	0.076	0.093	1.255	1.256	27.76	34.00	0.348	0.426
1.065	1.066	7.73	9.47	0.082	0.102	1.260	1.261	28.22	34.57	0.356	0.435
....	1.0697	....	10.	....	....	....	1.265	....	35.	....	....
1.070	1.071	8.32	10.19	0.089	0.109	1.265	1.266	28.69	35.14	0.363	0.444
1.075	1.076	8.90	10.90	0.096	0.117	1.270	1.271	29.15	35.70	0.370	0.454
1.080	1.081	9.47	11.60	0.103	0.125	1.275	1.276	29.62	36.29	0.377	0.462
....	1.0856	10.	....	....	....	....	1.280	30.	....	....	....
1.085	1.086	10.04	12.30	0.109	0.133	1.280	1.281	30.10	36.87	0.385	0.472
1.090	1.091	10.60	12.99	0.116	0.142	1.285	1.286	30.57	37.45	0.393	0.481
1.095	1.096	11.16	13.67	0.122	0.150	1.290	1.291	31.04	38.03	0.400	0.490
1.100	1.101	11.71	14.35	0.129	0.158	1.295	1.296	31.52	38.61	0.408	0.500
....	1.1058	....	15.	....	....	1.300	1.301	31.99	39.19	0.416	0.510
1.105	1.106	12.27	15.03	0.136	0.166	1.305	1.306	32.46	39.77	0.424	0.519
1.110	1.111	12.82	15.71	0.143	0.175	....	1.308	....	40.	....	....
1.115	1.116	13.36	16.36	0.149	0.183	1.310	1.311	32.94	40.35	0.432	0.529
1.120	1.121	13.89	17.01	0.156	0.191	1.315	1.316	33.41	40.93	0.439	0.538
1.125	1.126	14.42	17.66	0.162	0.199	1.320	1.3215	33.88	41.50	0.447	0.548
1.130	1.131	14.95	18.31	0.169	0.207	1.325	1.327	34.35	42.08	0.455	0.557
....	1.1315	15.	....	....	....	1.330	1.332	34.80	42.66	0.462	0.567
1.135	1.136	15.48	18.96	0.176	0.215	....	1.334	35.	....	....	....
1.140	1.141	16.01	19.61	0.183	0.223	1.335	1.337	35.27	43.20	0.471	0.577
....	1.144	....	20.	....	....	1.340	1.342	35.71	43.74	0.479	0.586
1.145	1.146	16.54	20.26	0.189	0.231	1.345	1.347	36.14	44.28	0.486	0.596
1.150	1.151	17.07	20.91	0.196	0.239	1.350	1.352	36.58	44.82	0.494	0.605
1.155	1.156	17.59	21.55	0.203	0.248	....	1.354	....	45.	....	....
1.160	1.161	18.11	22.19	0.210	0.257	1.355	1.357	37.02	45.35	0.502	0.614
1.165	1.166	18.64	22.83	0.217	0.266	1.360	1.362	37.45	45.88	0.510	0.624
1.170	1.171	19.16	23.47	0.224	0.275	1.365	1.367	37.89	46.61	0.517	0.633
1.175	1.176	19.69	24.12	0.231	0.283	1.370	1.372	38.32	46.94	0.525	0.643
....	1.179	20.	....	....	....	1.375	1.377	38.75	47.47	0.533	0.653
1.180	1.181	20.21	24.76	0.238	0.292	1.380	1.382	39.18	48.00	0.541	0.662
....	1.1829	....	25.	....	....	1.385	1.387	39.62	48.53	0.549	0.672
1.185	1.186	20.73	25.40	0.246	0.301	....	1.3914	40.	....	....	....
1.190	1.191	21.26	26.04	0.253	0.310	1.390	1.392	40.05	49.06	0.557	0.682

Sulphuric Acid.—*Continued.*

Specific Gravity 15° C. at 4° C. in vacuo.	Specific Gravity 15° C. at 15° C. in air.	100 Parts contain ... Parts of		1 Liter contains ... Kilos of		Specific Gravity 15° C. at 4° C. in vacuo.	Specific Gravity 15° C. at 15° C. in air.	100 Parts contain ... Parts of		1 Liter contains ... Kilos of	
		SO ₃ .	H ₂ SO ₄ .	SO ₃ .	H ₂ SO ₄ .			SO ₃ .	H ₂ SO ₄ .	SO ₃ .	H ₂ SO ₄ .
1.395	1.397	40.48	49.59	0.564	0.692	1.610	1.612	56.68	69.43	0.913	1.118
....	1.401	....	50.	....	....	1.615	1.617	57.05	69.89	0.921	1.128
1.400	1.402	40.91	50.11	0.573	0.702	....	1.618	....	70.	....	....
1.405	1.407	41.33	50.63	0.581	0.711	1.620	1.622	57.40	70.32	0.930	1.139
1.410	1.412	41.76	51.15	0.589	0.721	1.625	1.627	57.75	70.74	0.938	1.150
1.415	1.417	42.17	51.66	0.597	0.730	1.630	1.632	58.09	71.16	0.947	1.160
1.420	1.422	42.57	52.15	0.604	0.740	1.635	1.637	58.43	71.57	0.955	1.170
1.425	1.427	42.96	52.63	0.612	0.750	1.640	1.642	58.77	71.99	0.964	1.181
1.430	1.432	43.36	53.11	0.620	0.759	1.645	1.647	59.10	72.40	0.972	1.192
1.435	1.437	43.75	53.59	0.628	0.769	1.650	1.652	59.45	72.82	0.981	1.202
1.440	1.442	44.14	54.07	0.636	0.779	1.655	1.657	59.79	73.23	0.989	1.212
1.445	1.447	44.53	54.55	0.643	0.789	....	1.661	60.	....	....	....
....	1.4517	....	55.	....	....	1.660	1.662	60.11	73.64	0.998	1.222
1.450	1.452	44.92	55.03	0.651	0.798	1.665	1.667	60.46	74.07	1.007	1.233
....	1.453	45.	....	....	....	1.670	1.672	60.82	74.51	1.016	1.244
1.455	1.457	45.31	55.50	0.659	0.808	1.675	1.677	61.20	74.97	1.025	1.256
1.460	1.462	45.69	55.97	0.667	0.817	....	1.6773	....	75.	....	....
1.465	1.467	46.07	56.43	0.675	0.827	1.680	1.682	61.57	75.42	1.034	1.267
1.470	1.472	46.45	56.90	0.683	0.837	1.685	1.687	61.93	75.86	1.043	1.278
1.475	1.477	46.83	57.37	0.691	0.846	1.690	1.692	62.29	76.30	1.053	1.289
1.480	1.482	47.21	57.83	0.699	0.856	1.695	1.697	62.64	76.73	1.062	1.301
1.485	1.487	47.57	58.28	0.707	0.865	1.700	1.702	63.00	77.17	1.071	1.312
1.490	1.492	47.95	58.74	0.715	0.876	1.705	1.707	63.35	77.60	1.080	1.323
1.495	1.497	48.34	59.22	0.723	0.885	1.710	1.712	63.70	78.04	1.089	1.334
1.500	1.502	48.73	59.70	0.731	0.896	1.715	1.717	64.07	78.48	1.099	1.346
....	1.505	....	60.	....	....	1.720	1.722	64.43	78.92	1.108	1.357
1.505	1.507	49.12	60.18	0.739	0.906	1.725	1.727	64.78	79.36	1.118	1.369
1.510	1.512	49.51	60.65	0.748	0.916	....	1.730	65.	....	....	....
1.515	1.517	49.89	61.12	0.756	0.926	1.730	1.732	65.14	79.80	1.127	1.381
....	1.5184	50.	....	....	....	....	1.734	....	80.	....	....
1.520	1.522	50.28	61.59	0.764	0.936	1.735	1.737	65.50	80.24	1.136	1.392
1.525	1.527	50.66	62.06	0.773	0.946	1.740	1.742	65.86	80.68	1.146	1.404
1.530	1.532	51.04	62.53	0.781	0.957	1.745	1.747	66.22	81.12	1.156	1.416
1.535	1.537	51.43	63.00	0.789	0.967	1.750	1.752	66.58	81.56	1.165	1.427
1.540	1.542	51.78	63.43	0.797	0.977	1.755	1.757	66.94	82.00	1.175	1.439
1.545	1.547	52.12	63.85	0.805	0.987	1.760	1.762	67.30	82.44	1.185	1.451
1.550	1.552	52.46	64.26	0.813	0.996	1.765	1.767	67.65	82.88	1.194	1.463
1.555	1.557	52.79	64.67	0.821	1.006	1.770	1.772	68.02	83.32	1.204	1.475
....	1.561	....	65.	....	....	1.775	1.777	68.49	83.90	1.216	1.489
1.560	1.562	53.12	65.01	0.829	1.015	1.780	1.782	68.98	84.50	1.228	1.504
1.565	1.5670	53.46	65.49	0.837	1.025	....	1.786	....	85.	....	....
1.570	1.572	53.80	65.90	0.845	1.035	1.785	1.787	69.47	85.10	1.240	1.519
1.575	1.577	54.13	66.30	0.853	1.044	1.790	1.792	69.96	85.70	1.252	1.534
1.580	1.582	54.46	66.71	0.861	1.054	....	1.7924	70.	....	....	....
1.585	1.587	54.80	67.13	0.869	1.064	1.795	1.797	70.45	86.30	1.265	1.549
....	1.5896	55.	....	....	....	1.800	1.802	70.94	86.90	1.277	1.564
1.590	1.592	55.18	67.59	0.877	1.075	1.805	1.8075	71.50	87.60	1.291	1.581
1.595	1.597	55.55	68.05	0.886	1.085	1.810	1.813	72.08	88.30	1.305	1.598
1.600	1.602	55.93	68.51	0.895	1.096	1.815	1.818	72.69	89.05	1.319	1.621
1.605	1.607	56.30	68.97	0.904	1.107	....	1.8227	....	90.	....	....

Sulphuric Acid.—*Continued.*

Specific Gravity at 15° C. at 4° C. in vacuo.	Specific Gravity at 15° C. at 15° C. in air.	100 Parts contain ... Parts of		1 Liter contains ... Kilos of		Specific Gravity at 15° C. at 4° C. in vacuo.	Specific Gravity at 15° C. at 15° C. in air.	100 Parts contain ... Parts of		1 Liter contains ... Kilos of	
		SO ₃ .	H ₂ SO ₄ .	SO ₃ .	H ₂ SO ₄ .			SO ₃ .	H ₂ SO ₄ .	SO ₃ .	H ₂ SO ₄ .
1.820	1.823	73.51	90.05	1.338	1.639	1.836	1.839	76.57	93.80	1.406	1.722
1.821	1.824	73.63	90.20	1.341	1.643	1.837	1.8396	76.90	94.20	1.412	1.730
1.822	1.825	73.80	90.40	1.345	1.647	....	1.840	76.99	94.31	....	....
1.823	1.826	73.96	90.60	1.348	1.651	1.838	1.841	77.23	94.60	1.419	1.739
1.824	1.827	74.12	90.80	1.352	1.656	....	1.842	....	95.	....	....
1.825	1.828	74.29	91.00	1.356	1.661	1.839	1.842	77.55	95.00	1.426	1.748
1.826	1.829	74.49	91.25	1.360	1.666	1.840	1.843	78.04	95.60	1.436	1.759
1.827	1.830	74.69	91.50	1.364	1.671	1.8405	1.8431	78.33	95.95	1.441	1.765
1.828	1.831	74.86	91.70	1.368	1.676	1.8410	1.8436	79.19	97.00	1.458	1.786
....	1.8318	75.	....	....	....	1.8415	1.8441	79.76	97.70	1.469	1.799
1.829	1.832	75.03	91.90	1.372	1.681	....	1.8438	80.	....	....	....
1.830	1.833	75.19	92.10	1.376	1.685	1.8410	1.8436	80.16	98.20	1.476	1.808
1.831	1.834	75.35	92.30	1.380	1.690	1.8405	1.8431	80.57	98.70	1.483	1.816
1.832	1.835	75.53	92.52	1.384	1.695	1.8400	1.8426	80.98	99.20	1.490	1.825
1.833	1.836	75.72	92.75	1.388	1.700	1.8395	1.8421	81.18	99.45	1.494	1.830
1.834	1.837	75.96	93.05	1.393	1.706	1.8390	1.8416	81.39	99.70	1.497	1.834
1.835	1.838	76.27	93.43	1.400	1.713	1.8385	1.8411	81.59	99.95	1.500	1.838

NOTE.—The second vertical column, and the specific gravities corresponding to whole numbers of percentages by weight ending in 5 or 0, were added by the Committee of Revision.

See also Note to Table of Hydrochloric Acid, page 539.

AMMONIA WATER.

According to G. Lunge and T. Wiernik.

Specific Gravity at 15° C. at 4° C. in air.	Percent. of NH ₃ .	1 Liter at 15° C. contains ... Gm. of NH ₃ .	Correction of the Specific Gravity to be made for every 1° C. ±.	Specific Gravity at 15° C. at 4° C. in air.	Percent. of NH ₃ .	1 Liter at 15° C. contains ... Gm. of NH ₃ .	Correction of the Specific Gravity to be made for every 1° C. ±.
1.000	0.00	0.0	0.00018	0.938	16.22	152.1	0.00040
0.998	0.45	4.5	0.00018	0.936	16.82	157.4	0.00041
0.996	0.91	9.1	0.00019	0.934	17.42	162.7	0.00041
0.994	1.37	13.6	0.00019	0.932	18.03	168.1	0.00042
0.992	1.84	18.2	0.00020	0.930	18.64	173.4	0.00042
0.990	2.31	22.9	0.00020	0.928	19.25	178.6	0.00043
0.988	2.80	27.7	0.00021	0.926	19.87	184.2	0.00044
0.986	3.30	32.5	0.00021	0.9256	20.	....	.....
0.984	3.80	37.4	0.00022	0.924	20.49	189.3	0.00045
0.982	4.30	42.2	0.00022	0.922	21.12	194.7	0.00046
0.980	4.80	47.0	0.00023	0.920	21.75	200.1	0.00047
0.9792	5.	....	.....	0.918	22.39	205.6	0.00048
0.978	5.30	51.8	0.00023	0.916	23.03	210.9	0.00049
0.976	5.80	56.6	0.00024	0.914	23.68	216.3	0.00050
0.974	6.30	61.4	0.00024	0.912	24.33	221.9	0.00051
0.972	6.80	66.1	0.00025	0.910	24.99	227.4	0.00052
0.970	7.31	70.9	0.00025	0.9099	25.	....	.....
0.968	7.82	75.7	0.00026	0.908	25.65	232.9	0.00053
0.966	8.33	80.5	0.00026	0.906	26.31	238.3	0.00054
0.964	8.84	85.2	0.00027	0.904	26.98	243.9	0.00055
0.962	9.35	89.9	0.00028	0.902	27.65	249.4	0.00056
0.960	9.91	95.1	0.00029	0.9009	28.	....	.....
0.9597	10.	....	.....	0.900	28.33	255.0	0.00057
0.958	10.47	100.3	0.00030	0.898	29.01	260.5	0.00058
0.956	11.03	105.4	0.00031	0.896	29.69	266.0	0.00059
0.954	11.60	110.7	0.00032	0.8951	30.	....	.....
0.952	12.17	115.9	0.00033	0.894	30.37	271.5	0.00060
0.950	12.74	121.0	0.00034	0.892	31.05	277.0	0.00060
0.948	13.31	126.2	0.00035	0.890	31.75	282.6	0.00061
0.946	13.88	131.3	0.00036	0.888	32.50	288.6	0.00062
0.944	14.46	136.5	0.00037	0.886	33.25	294.6	0.00063
0.9421	15.	....	.....	0.884	34.10	301.4	0.00064
0.942	15.04	141.7	0.00038	0.882	34.95	308.3	0.00065
0.940	15.63	146.9	0.00039				

NOTE.—The specific gravities for the percentages 5, 10, 15, 20, 25, 28, and 30, were added by the Committee of Revision.

SOLUTION OF POTASSA (POTASSIUM HYDRATE).

According to Gerlach.

Specific Gravity at 15° C.	Percent. of KOH.	Specific Gravity at 15° C.	Percent. of KOH.	Specific Gravity at 15° C.	Percent. of KOH.
1.009	1	1.230	25	1.527	49
1.017	2	1.241	26	1.539	50
1.025	3	1.252	27	1.552	51
1.033	4	1.264	28	1.565	52
1.041	5	1.278	29	1.578	53
1.049	6	1.288	30	1.590	54
1.058	7	1.300	31	1.604	55
1.065	8	1.311	32	1.618	56
1.074	9	1.324	33	1.630	57
1.083	10	1.336	34	1.641	58
1.092	11	1.349	35	1.655	59
1.101	12	1.361	36	1.667	60
1.111	13	1.374	37	1.682	61
1.119	14	1.387	38	1.695	62
1.128	15	1.400	39	1.705	63
1.137	16	1.411	40	1.718	64
1.146	17	1.425	41	1.729	65
1.155	18	1.438	42	1.740	66
1.166	19	1.450	43	1.751	67
1.177	20	1.462	44	1.768	68
1.188	21	1.475	45	1.780	69
1.198	22	1.488	46	1.790	70
1.209	23	1.499	47		
1.220	24	1.511	48		

SOLUTION OF SODA (SODIUM HYDRATE).

According to Gerlach.

Specific Gravity at 15° C.	Percent. of NaOH.	Specific Gravity at 15° C.	Percent. of NaOH.	Specific Gravity at 15° C.	Percent. of NaOH.
1.012	1	1.279	25	1.529	49
1.023	2	1.290	26	1.540	50
1.035	3	1.300	27	1.550	51
1.046	4	1.310	28	1.560	52
1.059	5	1.321	29	1.570	53
1.070	6	1.332	30	1.580	54
1.081	7	1.343	31	1.591	55
1.092	8	1.353	32	1.601	56
1.103	9	1.363	33	1.611	57
1.115	10	1.374	34	1.622	58
1.126	11	1.384	35	1.633	59
1.137	12	1.395	36	1.643	60
1.148	13	1.405	37	1.654	61
1.159	14	1.415	38	1.664	62
1.170	15	1.426	39	1.674	63
1.181	16	1.437	40	1.684	64
1.192	17	1.447	41	1.695	65
1.202	18	1.456	42	1.705	66
1.213	19	1.468	43	1.715	67
1.225	20	1.478	44	1.726	68
1.236	21	1.488	45	1.737	69
1.247	22	1.499	46	1.748	70
1.258	23	1.508	47		
1.269	24	1.519	48		

SATURATION TABLES.

I.—Table showing the Quantity of Official Alkalies required to saturate 100 Parts of an Official Acid, together with the Quantity of Product.

ACIDS.	AMMONIUM.				POTASSIUM.				SODIUM.					
	Ammon. Carbon., 100 %.	Ammonia Water, 10 %.	Ammonia Water, 28 %.	Product.	Potassa, 90 %.	Solution of Potassa, 5 %.	Potassium Bi-carbon., 100 %.	Potassium Carbon., 95 %.	Product.	Soda, 90 %.	Solution of Soda, 5 %.	Sodium Bi-carbon., 98.6 %.	Sodium Carbon., 98.9 %.	Product.
OF PERCENT.														
Acetic	31.43	102.30	36.53	46.23	37.41	673.45	60.07	43.65	58.87	26.70	480.64	51.14	86.79	81.63
“ Diluted	5.24	17.05	6.09	7.70	6.22	112.24	10.01	7.27	9.81	4.45	80.11	8.52	14.46	13.61
“ Glacial.....	86.43	281.32	100.47	127.13	102.89	1851.99	165.19	120.00	161.90	73.43	1321.76	140.65	238.66	224.49
Arsenous	52.23	170.03	60.72	124.78	62.19	1119.35	99.84	72.55	145.79	44.38	798.88	85.01	144.25	129.85
Benzoic	42.94	139.76	49.91	113.96	51.11	920.06	82.06	59.63	175.51	36.48	656.64	69.87	118.57	118.07
Citric	74.83	243.58	87.00	124.36	89.09	1603.53	143.03	103.93	154.46	63.58	1133.95	121.78	206.65	170.08
Hydrobromic, Diluted. 10	6.47	21.06	7.52	12.11	7.70	138.66	12.37	8.99	14.71	5.50	98.96	10.53	17.87	12.72
Hydrochloric	45.84	149.19	53.28	46.82	54.57	982.17	87.60	63.66	65.26	38.94	700.97	74.59	126.57	51.20
“ Diluted.. 10	14.37	46.77	16.70	14.68	17.10	307.89	27.46	19.96	20.46	12.21	219.74	23.38	39.68	16.05
Lactic.....	43.65	142.08	50.74	89.21	51.96	935.35	83.43	60.62	106.77	37.09	667.56	71.03	120.54	93.38
Nitric	56.51	183.92	65.69	86.39	67.27	1210.79	108.00	78.48	109.12	48.01	864.14	91.95	156.03	91.79
“ Diluted.....	8.31	27.05	9.66	12.70	9.89	178.06	15.88	11.54	16.05	7.06	127.08	13.52	22.95	13.50
Phosphoric	90.83	295.67	105.60	114.58	108.14	1946.48	173.62	126.16	151.11	77.18	1389.20	147.82	250.84	310.55
“ Diluted.... 10	10.69	34.78	12.42	13.48	12.72	229.00	20.43	14.84	17.78	9.08	163.43	17.39	29.51	36.54
Salicylic	37.96	123.55	44.13	112.36	45.19	813.39	72.55	52.72	127.62	32.25	580.52	61.77	104.82	115.98
Sulphuric.....	98.83	321.70	114.90	124.67	117.65	2117.80	188.90	137.26	164.42	83.97	1511.47	160.83	272.92	303.94
“ Diluted	10.68	34.78	12.42	13.48	12.72	228.95	20.42	14.84	17.78	9.08	163.40	17.39	29.50	32.86
Tartaric	69.84	227.35	81.19	122.73	83.15	1496.66	133.49	97.00	156.83	59.34	1068.16	113.66	192.87	153.41

II.—Table showing the Quantity of Official Acids required to saturate 100 Parts of an Official Alkali, together with the Quantity of Product.

ACIDS.

ALKALIES.	OF PERCENT.	ACETIC.			ARSENOUS.		BENZOIC.		CITRIC.		HYDROBROMIC.		HYDROCHLORIC.			
		36 %.	6 %.	99 %.	PRODUCT.	98.8 %.	PRODUCT.	100 %.	PRODUCT.	100 %.	PRODUCT.	10 %.	PRODUCT.	31.9 %.	10 %.	PRODUCT.
Ammonium Car- bonate.....	100	318.17	1909.04	115.70	147.09	191.45	238.89	232.89	265.44	133.63	166.19	1545.35	187.08	218.16	695.94	102.14
Ammonia Water	10	97.75	586.52	35.55	45.19	58.81	73.40	71.55	81.55	41.05	51.05	474.78	57.48	67.03	213.82	31.38
Ammonia Water, Stronger....	28	273.71	1642.25	99.53	126.53	164.68	205.48	200.35	228.35	114.95	142.95	1329.38	160.94	187.68	598.68	87.87
Potassa.....	90	267.22	1603.68	97.19	157.35	160.81	234.44	195.64	343.38	112.25	173.38	1298.16	190.95	183.27	584.62	119.59
Solution of Po- tassa	5	14.85	89.09	5.40	8.74	8.93	13.02	10.87	19.08	6.24	9.63	72.12	10.61	10.18	32.48	6.64
Potassium Bicar- bonate.....	100	166.48	998.86	60.54	98.01	100.16	146.03	121.86	213.88	69.92	107.99	808.57	118.93	114.15	364.14	74.49
Potassium Car- bonate.....	95	229.10	1374.59	83.31	134.87	137.84	200.95	167.69	294.33	96.22	148.61	1112.72	163.67	157.09	501.11	102.51
Soda	90	374.50	2247.00	136.18	305.72	225.32	292.57	274.12	323.67	157.28	267.51	1818.92	231.44	256.78	819.14	131.46
Solution of Soda. Sodium Bicar- bonate.....	5	20.81	124.83	7.57	16.98	12.52	16.25	15.22	17.98	8.82	15.00	101.05	12.86	14.26	45.51	7.30
Sodium Carbon- ate	98.6	195.53	1173.17	71.10	159.62	117.64	152.75	143.12	168.99	82.12	139.67	949.66	120.84	134.07	427.68	68.64
	98.9	115.22	691.35	41.90	94.06	69.32	90.02	84.34	99.59	48.39	82.31	559.64	71.21	79.01	252.03	40.45

Continuation of Table showing the Quantity of Official Acids required to saturate 100 Parts of an Official Alkali, together with the Quantity of Product.

ACIDS.

ALKALIES.	LACTIC.		NITRIC.			PHOSPHORIC.			SALICYLIC.			SULPHURIC.			TARTARIC.	
	75 %.	PRODUCT.	68 %.	10 %.	PRODUCT.	85 %.	10 %.	PRODUCT.	100 %.	PRODUCT.	92.5 %.	10 %.	PRODUCT.	100 %.	PRODUCT.	
OF PERCENT.																
Ammonium Car- bonate.....	100	229.08	204.36	176.97	1203.41	152.89	110.09	935.80	126.13	263.43	295.98	101.19	935.99	126.15	143.18	175.73
Ammonia Water	10	70.38	62.79	54.37	369.72	46.97	33.82	287.48	38.75	80.93	90.93	31.08	287.54	38.75	43.99	53.99
Ammonia Water, Stronger....	28	197.07	175.80	152.24	1035.23	131.52	94.70	804.94	108.49	226.62	254.62	87.04	805.10	108.51	123.16	151.16
Potassa.....	90	192.44	205.46	148.66	1010.91	162.22	92.47	786.03	139.73	221.29	282.42	84.99	786.19	139.75	120.27	188.61
Solution of Po- tassa.....	5	10.69	11.41	8.26	56.16	9.01	5.14	43.67	7.76	12.29	15.69	4.72	43.68	7.76	6.68	10.48
Potassium Bicar- bonate.....	100	119.86	127.97	92.60	629.65	101.04	57.60	489.59	87.03	137.83	175.91	52.94	489.69	87.04	74.91	117.48
Potassium Car- bonate.....	95	164.95	176.11	147.43	866.50	139.05	79.26	673.75	119.77	189.68	242.08	72.85	673.89	119.79	103.09	161.67
Soda	90	269.64	251.78	208.30	1416.44	191.19	129.57	1101.35	402.39	310.07	359.62	119.09	1101.58	361.96	168.52	258.51
Solution of Soda. Sodium	5	14.98	13.99	11.57	78.69	10.62	7.20	61.19	22.35	17.23	19.98	6.62	61.20	20.11	9.36	14.36
Sodium Bicar- bonate.....	98.6	140.78	131.45	108.75	739.53	99.82	67.65	575.02	210.09	161.89	187.76	62.18	575.14	188.98	87.98	134.97
Sodium Carbon- ate	98.9	82.96	77.47	64.09	435.81	58.83	39.87	338.86	123.81	95.40	110.65	36.64	338.93	111.37	51.85	79.54

III.—Table showing the Quantity of Official Alkalies and Acids required to make 100 Parts of the corresponding Salts.

a.) AMMONIUM SALTS.

AMMONIUM SALTS.	PARTS OF ALKALI REQUIRED.			Parts.	PARTS OF ACID REQUIRED.
	Ammonium Carbonate, 100 %.	Ammonia Water, 10 %.	Ammonia Water, 28 %.		
Ammonium Acetate .. $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$ = 76.87.....	67.99	221.28	79.03	216.31	Acetic Acid..... 36
“ Arsenite. NH_4AsO_2 = 124.83.....	41.86	136.27	48.67	1297.86	“ Diluted..... 6
“ Benzoate. $\text{NH}_4\text{C}_7\text{H}_5\text{O}_2$ = 138.72.....	37.67	122.62	43.79	78.65	“ Glacial..... 99
“ Bromide. NH_4Br = 97.77.....	53.45	173.98	62.13	80.14	Arsenous Acid..... 98.8
“ Chloride. NH_4Cl = 53.38.....	97.90	318.66	113.81	87.74	Benzoic Acid..... 100
“ Citrate .. $(\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7$ = 260.53.....	60.17	195.87	69.95	826.02	Hydrobromic Acid, Diluted.. 10
“ Lactate... $\text{NH}_4\text{C}_3\text{H}_5\text{O}_3$ = 106.8	48.93	159.27	56.88	213.59	Hydrochloric Acid 31.9
“ Nitrate... NH_4NO_3 = 79.9	65.41	212.89	76.03	681.34	“ Diluted .. 10
“ Phosphate $(\text{NH}_4)_2\text{HPO}_4$ = 131.82.....	79.28	258.08	92.17	80.41	Citric Acid..... 100
“ Salicylate $\text{NH}_4\text{C}_7\text{H}_5\text{O}_3$ = 154.68.....	33.79	109.97	39.27	112.10	Lactic Acid 75
“ Sulphate. $(\text{NH}_4)_2\text{SO}_4$ = 131.84.....	79.27	258.04	92.16	115.75	Nitric Acid..... 68
“ Tartrate.. $(\text{NH}_4)_2\text{C}_4\text{H}_4\text{O}_6$ = 183.66.....	56.90	185.23	66.15	787.11	“ Diluted..... 10
				87.28	Phosphoric Acid..... 85
				741.92	“ Diluted 10
				89.00	Salicylic Acid 100
				80.21	Sulphuric Acid 92.5
				741.96	“ Diluted 10
				81.48	Tartaric Acid 100

Continuation of Table showing the Quantity of Official Alkalies and Acids required to make 100 Parts of the corresponding Salts.

b.) POTASSIUM SALTS.

POTASSIUM SALTS.	PARTS OF ALKALI REQUIRED.				Parts.	PARTS OF ACID REQUIRED.
	Potassa, 90 %.	Solution of Potassa, 5 %.	Potassium Bi- carbonate, 100 %.	Potassium Carbonate, 95 %.		
Potassium Acetate... $\text{KC}_2\text{H}_3\text{O}_2$		63.55	102.03	74.14	169.86	Acetic Acid 36
“	= 97.89..				1019.17	“ Diluted..... 6
“ Arsenite... KAsO_2	= 145.85..				61.77	“ Glacial 99
“ Benzoate... $\text{KC}_7\text{H}_5\text{O}_2 + 3\text{H}_2\text{O}$	= 213.62..	42.66	68.48	49.76	68.59	Arsenous Acid..... 98.8
“ Bromide... KBr	= 118.79..	29.12	46.76	33.97	56.97	Benzoic Acid..... 100
“ Chloride... KCl	= 74.4 ..	52.37	84.08	61.10	679.85	Hydrobromic Acid, Diluted . 10
“ Citrate.... $\text{K}_3\text{C}_6\text{H}_5\text{O}_7 + \text{H}_2\text{O}$	= 323.59..	83.62	134.25	97.55	153.24	Hydrochloric Acid..... 31.9
“ Lactate... $\text{KC}_3\text{H}_5\text{O}_3$	= 127.82..	57.68	92.60	67.29	488.84	“ Diluted .. 10
“ Nitrate.... KNO_3	= 100.92..	48.67	78.14	56.78	64.74	Citric Acid..... 100
“ Phosphate K_2HPO_4	= 173.86..	61.64	98.97	71.92	93.66	Lactic Acid 75
“ Salicylate. $\text{KC}_7\text{H}_5\text{O}_3$	= 175.7 ..	71.56	114.90	83.49	91.64	Nitric Acid..... 68
“ Sulphate.. K_2SO_4	= 173.88..	35.41	56.85	41.31	623.17	“ Diluted 10
“ Tartrate... $2\text{K}_2\text{C}_4\text{H}_4\text{O}_6 + \text{H}_2\text{O}$	= 469.36..	71.55	114.88	83.48	66.18	Phosphoric Acid..... 85
		52.02	85.12	61.85	562.52	“ Diluted 10
					78.36	Salicylic Acid 100
					60.82	Sulphuric Acid 92.5
					562.57	“ Diluted 10
					63.76	Tartaric Acid..... 100

Continuation of Table showing the Quantity of Official Alkalies and Acids required to make 100 Parts of the Corresponding Salts.

c.) SODIUM SALTS.

SODIUM SALTS.	PARTS OF ALKALI REQUIRED.				Parts.	PARTS OF ACID REQUIRED.	
	Soda, 90 %.	Solution of Soda, 5 %.	Sodium Bi- carbonate, 98.6 %.	Sodium Carbonate, 98.9 %.			OF PERCENT.
Sodium Acetate.... $\text{NaC}_2\text{H}_3\text{O}_2 + 3\text{H}_2\text{O}$	32.71	588.77	62.65	106.31	122.50	Acetic Acid	36
" Arsenite... NaAsO_2	34.18	615.24	65.47	111.09	734.98	" Diluted	6
" Benzoate... $\text{NaC}_7\text{H}_5\text{O}_2$	30.90	556.12	59.17	100.42	44.54	" Glacial	99
" Bromide... NaBr	43.21	777.73	82.76	140.43	77.01	Arsenous Acid	98.8
" Chloride... NaCl	76.07	1369.20	145.69	247.23	84.69	Benzoic Acid	100
" Citrate.... $2\text{Na}_3\text{C}_6\text{H}_5\text{O}_7 + 11\text{H}_2\text{O}$	37.38	666.71	71.60	121.50	785.91	Hydrobromic Acid, Diluted	10
" Lactate... $\text{NaC}_3\text{H}_5\text{O}_3$	39.72	714.91	76.07	129.09	195.33	Hydrochloric Acid	31.9
" Nitrate... NaNO_3	52.30	941.45	100.18	169.99	623.09	" Diluted	10
" Phosphate... $\text{Na}_2\text{HPO}_4 + 12\text{H}_2\text{O}$	24.29	447.33	47.60	80.77	58.80	Citric Acid	100
" Salicylate... $\text{NaC}_7\text{H}_5\text{O}_3$	27.81	500.53	53.26	90.38	107.09	Lactic Acid	75
" Sulphate... $\text{Na}_2\text{SO}_4 + 10\text{H}_2\text{O}$	27.63	497.29	52.92	89.79	108.95	Nitric Acid	68
" Tartrate... $\text{Na}_2\text{C}_4\text{H}_4\text{O}_6 + 2\text{H}_2\text{O}$	38.68	696.29	74.09	125.73	740.84	" Diluted	10
					32.20	Phosphoric Acid	85
					273.70	" Diluted	10
					86.22	Salicylic Acid	100
					32.90	Sulphuric Acid	92.5
					304.34	" Diluted	10
					65.19	Tartaric Acid	100

EQUIVALENTS OF WEIGHTS AND MEASURES, Customary and Metric.

NOTE.—The values given for the relation of weight to measure are for Water at the temperature of 4° C. (39.2° F.) *in vacuo*. For ordinary, practical purposes, these values may be used without correction.

Weights, customary.						Metric Weight and Measure. Gm.] [Cc.	Measures, customary.		
Grains.	Troy		Avoirdupois				Fluid		Fluid-ounces and fractions.
	oz.	grains.	lbs.	oz.	grains.		ounces.	minims.	
15432.4	32	72.4	2	3	119.9	1000	33	390.6	33.814
15360	32	....	2	3	47.5	995.312	33	314.5	33.655
15060.9	31	180.9	2	2	185.9	975.932	33	....	33
15046.6	31	166.6	2	2	171.6	975	32	464.9	32.968
14880	31	....	2	2	5	964.208	32	289.7	32.604
14660.7	30	260.7	2	1	223.2	950	32	59.1	32.123
14604.5	30	204.5	2	1	167	946.358	32	....	32
14400	30	....	2	..	400	933.105	31	264.9	31.552
14274.9	29	354.9	2	..	274.9	925	31	133.3	31.278
14148.2	29	228.2	2	..	148.2	916.785	31	....	31
14000	29	80	2	..	....	907.185	30	324.2	30.676
13920	29	....	1	15	357.5	902.000	30	240	30.500
13889.1	28	449.1	1	15	326.6	900	30	207.6	30.432
13691.8	28	251.8	1	15	129.3	887.211	30	....	30
13562.5	28	122.5	1	15	....	878.635	29	344.1	29.717
13503.3	28	63.3	1	14	378.3	875	29	281.8	29.587
13440	28	....	1	14	315	870.898	29	215.2	29.448
13235.4	27	275.4	1	14	110.4	857.637	29	....	29
13125	27	165	1	14	....	850.486	28	363.9	28.759
13117.5	27	157.5	1	13	430	850	28	356	28.742
12960	27	....	1	13	272.5	839.794	28	190.4	28.397
12779	26	299	1	13	91.5	828.064	28	....	28
12731.7	26	251.7	1	13	44.2	825	27	430.3	27.896
12687.5	26	207.5	1	13	....	822.136	27	383.8	27.800
12480	26	....	1	12	230	808.691	27	165.6	27.345
12345.9	25	345.9	1	12	95.9	800	27	24.5	27.051
12322.6	25	322.6	1	12	72.6	798.490	27	....	27
12250	25	250	1	12	....	793.787	26	403.7	26.841
12000	25	....	1	11	187.5	777.587	26	140.7	26.293
11960.1	24	440.1	1	11	147.6	775	26	98.7	26.206
11866.2	24	346.2	1	11	53.7	768.916	26	....	26
11812.5	24	292.5	1	11	....	765.437	25	423.6	25.883
11574.3	24	54.3	1	10	199.3	750	25	173	25.360
11520	24	....	1	10	145	746.484	25	115.9	25.241
11409.8	23	369.8	1	10	34.8	739.343	25	....	25
11375	23	335	1	10	....	737.087	24	443.4	24.924
11188.5	23	148.5	1	9	251	725	24	247.2	24.515
11040	23	....	1	9	102.5	715.380	24	91.1	24.190
10953.4	22	393.4	1	9	15.9	709.769	24	....	24
10937.5	22	377.5	1	9	....	708.738	23	463.3	23.966

Equivalents of Weights and Measures.—*Continued.*

Weights, customary.						Metric Weight and Measure. Gm.] [Cc.	Measures, customary.		
Grains.	Troy		Avoirdupois				Fluid		Fluid-ounces and fractions.
	oz.	grains.	lbs.	oz.	grains.		ounces.	minims.	
10802.6	22	242.6	1	8	302.6	700	23	321.4	23.670
10560	22	....	1	8	60	684.277	23	66.2	23.138
10500	21	420	1	8	....	680.388	23	3.1	23.007
10497.0	21	417	1	7	434.5	680.195	23	....	23
10416.8	21	336.8	1	7	354.3	675	22	395.7	22.824
10080.	21	....	1	7	17.5	653.173	22	41.4	22.086
10062.5	20	462.5	1	7	....	652.039	22	23.0	22.048
10040.6	20	440.6	1	6	415.6	650.621	22	....	22
10031.0	20	431	1	6	406	650	21	469.9	21.979
9645.2	20	45.2	1	6	20.2	625	21	64.1	21.134
9625	20	25	1	6	....	623.689	21	42.9	21.09
9600	20	....	1	5	412.5	622.070	21	16.6	21.035
9584.2	19	464.2	1	5	396.7	621.048	21	....	21
9259.4	19	139.4	1	5	71.9	600	20	138.4	20.288
9187.5	19	67.5	1	5	....	595.340	20	62.7	20.131
9127.8	19	7.8	1	4	377.8	591.474	20	....	20
9120	19	....	1	4	370	590.966	19	471.8	19.983
8873.6	18	233.6	1	4	123.6	575	19	212.6	19.443
8750	18	110	1	4	....	566.990	19	82.6	19.172
8671.4	18	31.4	1	3	358.9	561.900	19	....	19
8640	18	....	1	3	327.5	559.863	18	447	18.931
8487.8	17	327.8	1	3	175.3	550	18	286.8	18.598
8312.5	17	152.5	1	3	....	538.641	18	102.5	18.214
8215.1	17	55.1	1	2	340.1	532.327	18	....	18
8160	17	....	1	2	285	528.759	17	422.1	17.880
8102	16	422	1	2	227	525	17	361.1	17.752
7875	16	195	1	2	....	510.291	17	122.4	17.255
7758.7	16	78.7	1	1	321.2	502.753	17	....	17
7716.2	16	36.2	1	1	278.7	500	16	435.3	16.907
7680	16	....	1	1	242.5	497.656	16	397.2	16.828
7437.5	15	237.5	1	1	....	481.942	16	142.2	16.297
7330.4	15	130.4	1	..	330.4	475	16	29.6	16.062
7302.3	15	102.3	1	..	302.3	473.179	16	....	16
7200	15	....	1	..	200	466.552	15	372.4	15.776
7000	14	280	1	..	....	453.592	15	162.1	15.338
6944.6	14	224.6	..	15	382.1	450	15	103.8	15.216
6845.9	14	125.9	..	15	283.4	443.606	15	....	15
6720	14	....	..	15	157.5	435.449	14	347.6	14.724
6562.5	13	322.5	..	15	....	425.243	14	182	14.379
6558.8	13	318.8	..	14	433.8	425	14	178.0	14.371
6389.5	13	149.5	..	14	264.5	414.032	14	....	14
6240	13	....	..	14	115	404.345	13	322.8	13.672

Equivalents of Weights and Measures.—*Continued.*

Weights, customary.						Metric Weight and Measure.		Measures, customary.		
Grains.	Troy		Avoirdupois			Gm.] [Cc.		Fluid		Fluid-ounces and fractions.
	oz.	grains.	lbs.	oz.	grains.			ounces.	minims.	
6172.9	12	412.9	..	14	47.9	400		13	252.3	13.526
6125	12	365	..	14	....	396.893		13	201.8	13.421
5933.1	12	173.1	..	13	245.6	384.458		13	....	13
5787.1	12	27.1	..	13	99.6	375		12	326.5	12.680
5760	12	....	..	13	72.5	373.242		12	298	12.621
5687.5	11	407.5	..	13	....	368.544		12	221.7	12.462
5476.7	11	196.7	..	12	226.7	354.884		12	....	12
5401.3	11	121.3	..	12	151.3	350		11	400.7	11.835
5280	11	....	..	12	30	342.138		11	273.1	11.570
5250	10	450	..	12	....	340.194		11	241.6	11.503
5020.3	10	220.3	..	11	207.8	325.311		11	....	11
5015.5	10	215.5	..	11	203	325		10	475	10.989
4812.5	10	12.5	..	11	....	311.845		10	261.4	10.545
4800	10	....	..	10	425	311.035		10	248.3	10.517
4629.7	9	309.7	..	10	254.7	300		10	69.2	10.144
4563.9	9	243.9	..	10	188.9	295.737		10	....	10
4375	9	55	..	10	....	283.495		9	281.3	9.586
4320	9	....	..	9	382.5	279.930		9	223.5	9.466
4244	8	404	..	9	306.5	275		9	143.4	9.299
4107.5	8	267.5	..	9	170	266.163		9	....	9
3937.5	8	97.5	..	9	....	255.146		8	301.2	8.628
3858.1	8	18.1	..	8	358.1	250		8	217.7	8.453
3840	8	....	..	8	340	248.828		8	198.6	8.414
3651.1	7	291.1	..	8	151.1	236.590		8	....	8
3500	7	140	..	8	....	226.796		7	321.0	7.669
3472.3	7	112.3	..	7	409.8	225		7	291.9	7.608
3360	7	....	..	7	297.5	217.724		7	173.8	7.362
3194.7	6	314.7	..	7	132.2	207.016		7	....	7
3086.5	6	206.5	..	7	24	200		6	366.1	6.763
3062.5	6	182.5	..	7	....	198.447		6	340.9	6.710
2880	6	....	..	6	255	186.621		6	149	6.310
2738.4	5	338.4	..	6	113.4	177.442		6	....	6
2700.7	5	300.7	..	6	75.7	175		5	440.4	5.917
2625	5	225	..	6	....	170.097		5	360.8	5.752
2400	5	....	..	5	212.5	155.517		5	124.1	5.259
2314.9	4	394.9	..	5	127.4	150		5	34.6	5.072
2282	4	362	..	5	94.5	147.869		5	....	5
2187.5	4	267.5	..	5	....	141.748		4	380.7	4.793
1929	4	9	..	4	179	125		4	108.8	4.227
1920	4	....	..	4	170	124.414		4	99.3	4.207
1825.6	3	385.6	..	4	75.6	118.295		4	....	4
1750	3	310	..	4	....	113.398		3	400.5	3.834

Equivalents of Weights and Measures.—*Continued.*

Weights, customary.					Metric Weight and Measure. Gm.] [Cc.	Measures, customary.			
Grains.	Troy		Avoirdupois			Fluid		Fluid-ounces and fractions.	
	oz.	grains.	lbs.	oz.		grains.	ounces.		minims.
1543.2	3	103.2	..	3	230.7	100	3	183.1	3.381
1440	3	....	..	3	127.5	93.310	3	74.5	3.155
1388.9	2	428.9	..	3	76.4	90	3	20.8	3.043
1369.2	2	409.2	..	3	56.7	88.721	3	....	3
1312.5	2	352.5	..	3	....	85.049	2	420.4	2.876
1234.6	2	274.6	..	2	359.6	80	2	338.5	2.705
1157.4	2	197.4	..	2	282.4	75	2	257.3	2.536
1080.3	2	120.3	..	2	205.3	70	2	176.1	2.367
960	2	....	..	2	85	62.207	2	49.7	2.103
925.9	1	445.9	..	2	50.9	60	2	13.8	2.029
912.8	1	432.8	..	2	37.8	59.147	2	....	2
875	1	395	..	2	....	56.699	1	440.3	1.917
771.6	1	291.6	..	1	334.1	50	1	331.5	1.691
617.3	1	137.3	..	1	179.8	40	1	169.2	1.353
480	1	....	..	1	42.5	31.1035	1	24.8	1.052
463	..	....	..	1	25.4	30	1	6.9	1.014
456.392	..	....	..	1	18.89	29.574	1	....	1
437.5	..	....	..	1	....	28.350	..	460.1307	0.959
385.8	..	....	..	..	....	25	..	405.8	0.845
308.6	..	....	..	..	....	20	..	324.61	0.676
154.3	..	....	..	..	....	10	..	162.31	0.338
15.4324	..	....	..	..	....	1	..	16.23	0.034
1	..	....	..	..	....	0.06479	..	1.0517	0.0022
0.9508	..	....	..	..	....	0.06161	..	1	0.0021

Equivalents of Weights and Measures.—*Continued.*

From 1 Troy Ounce down.

Grains.	Metric Weight and Measure. Gm.] [Cc.	Minims (of Water at 4° C.).	Grains.	Metric Weight and Measure. Gm.] [Cc.	Minims (of Water at 4° C.).
480 [1 $\frac{2}{3}$	31.103	504.8	240 [4 $\frac{2}{3}$	15.551	252.4
478.4	31	503.1	231.5	15	243.4
475.4	30.805	500	228.2	14.786	240
463.0	30	486.9	218.75 [$\frac{1}{2}$ av. oz.	14.175	230.1
456.4	29.573	480	216.1	14	227.2
450	29.159	473.3	210	13.607	220.9
447.5	29	470.7	200.6	13	211
437.5 [1 $\frac{1}{2}$ av. oz.	28.350	460.1	199.7	12.938	210
432.1	28	454.4	185.2	12	194.8
427.9	27.724	450			
420 [7 $\frac{1}{3}$	27.214	441.7	180 [3 $\frac{1}{3}$	11.663	189.3
416.7	27	438.2	171.1	11.090	180
401.2	26	422	169.8	11	178.5
399.3	25.876	420	154.3	10	162.3
390	25.271	410.2	150	9.719	157.8
385.8	25	405.7	142.6	9.241	150
380.3	24.644	400	138.9	9	146.1
370.8	24.028	390	123.5	8	129.8
370.4	24	389.5			
360 [6 $\frac{2}{3}$	23.327	378.6	120 [2 $\frac{2}{3}$	7.775	126.2
354.9	23	373.3	114.1	7.393	120
342.3	22.180	360	109.37 [$\frac{1}{4}$ av. oz.	7.088	115.9
339.5	22	357.1	108.0	7	113.6
330	21.383	347.1	100	6.480	105.2
324.1	21	340.8	95.1	6.161	100
313.8	20.331	330	92.6	6	97.4
308.6	20	324.6	80	5.184	84.1
			77.2	5	81.1
			76.1	4.928	80
			61.7	4	64.9
300 [5 $\frac{1}{3}$	19.440	315.5	60 [1 $\frac{2}{3}$	3.888	63.1
293.2	19	308.4	57.0	3.696	60
285.2	18.483	300	54.69 [$\frac{1}{8}$ av. oz.	3.544	57.5
277.8	18	292.1	47.5	3.080	50
270	17.495	284.0	50	3.240	52.6
262.3	17	275.9	46.3	3	48.7
256.7	16.635	270	42.8	2.772	45
246.9	16	259.7	40	2.592	42.1
			38.0	2.464	40
			33.3	2.156	35
			30.9	2	32.5

Equivalents of Weights and Measures.—*Continued.*

Continuation of Table of Equivalents from 1 Troy Ounce down.

Equivalents of Weights from 5 Grains down.

Grains.	Metric Weight and Measure. Gm.] [Cc.	Minims (of Water at 4° C.).	Grammes.	Grains	
				in decimal fractions.	in common fractions (approximate).
30 [$\frac{1}{2}$ 3]	1.944	31.6	0.324	5	5
28.5	1.848	30	0.291	4.5	$4\frac{1}{2}$
23.8	1.540	25	0.259	4	4
20	1.296	21.0	0.226	3.5	$3\frac{1}{2}$
19.0	1.232	20	0.194	3	3
15.4324	1	16.23	0.162	2.5	$2\frac{1}{2}$
			0.130	2	2
			0.097	1.5	$1\frac{1}{2}$
			0.065	1	1
15	0.972	15.9			
14.3	0.924	15			
14	0.907	14.7	0.061	0.94	$\frac{15}{16}$
13.3	0.862	14	0.060	0.93	$\frac{9}{10}$
13	0.842	13.7	0.057	0.88	$\frac{7}{8}$
12.4	0.801	13	0.053	0.82	$\frac{13}{16}$
12	0.775	12.6	0.050	0.77	$\frac{4}{5}$
11.4	0.739	12	0.049	0.76	$\frac{3}{4}$
11	0.713	11.6	0.045	0.69	$\frac{11}{16}$
10.5	0.678	11	0.040	0.62	$\frac{10}{16}$
			0.036	0.56	$\frac{9}{16}$
			0.032	0.5	$\frac{1}{2}$
10	0.648	10.5			
9.5	0.616	10			
9	0.583	9.5	0.028	0.43	$\frac{7}{16}$
8.6	0.554	9	0.025	0.39	$\frac{2}{5}$
8	0.518	8.4	0.024	0.37	$\frac{3}{8}$
7.7	0.5	8.1	0.020	0.31	$\frac{5}{16}$
7.6	0.493	8	0.016	0.24	$\frac{1}{4}$
7	0.454	7.4	0.012	0.18	$\frac{3}{16}$
6.7	0.431	7	0.008	0.12	$\frac{1}{8}$
6	0.389	6.3	0.004	0.06	$\frac{1}{16}$
5.7	0.370	6	0.0032	0.05	$\frac{1}{20}$
			0.0027	0.04	$\frac{1}{25}$
5	0.324	5.3	0.0022	0.033	$\frac{1}{30}$
4.8	0.308	5	0.0018	0.028	$\frac{1}{36}$
4	0.259	4.2	0.0016	0.025	$\frac{1}{40}$
3.8	0.246	4	0.0013	0.02	$\frac{1}{50}$
3	0.194	3.2	0.0011	0.017	$\frac{1}{60}$
2.9	0.185	3	0.001	0.015	$\frac{1}{64}$
2	0.130	2.1	0.0006	0.01	$\frac{1}{100}$
1.9	0.123	2	0.0005	0.008	$\frac{1}{125}$
1	0.065	1.0517	0.0004	0.0065	$\frac{1}{160}$
0.9508	0.06161	1	0.0003	0.005	$\frac{1}{200}$
			0.0002	0.003	$\frac{1}{320}$
			0.0001	0.0015	$\frac{1}{640}$

EQUIVALENTS OF MEASURES OF LENGTH,
Customary and Metric.

Centi- meters.	Inches.	Centi- meters.	Inches.	Milli- meters.	Inches	
					in decimal fractions.	in 32ds.
150	59.06	55	21.65	25.4	1.	$\frac{32}{32}$
145	57.09	53.3	21	25	0.98	..
140	55.12	50.8	20	24	0.94	..
139.7	55	50	19.69	23.8	0.94	$\frac{30}{32}$
135	53.15	48.3	19	23	0.90	$\frac{29}{32}$
130	51.18	45.7	18	22.2	0.87	$\frac{28}{32}$
127.0	50	45	17.72	22	0.87	..
125	49.21	43.2	17	21	0.83	..
120	47.24	40.6	16	20.6	0.81	$\frac{26}{32}$
115	45.28	40	15.75	20	0.79	..
114.3	45	38.1	15	19.1	0.75	$\frac{24}{32}$
110	43.31	35.6	14	19	0.75	..
105	41.34	35	13.78	18	0.71	..
101.6	40	33.0	13	17.5	0.69	$\frac{22}{32}$
100	39.37	30.5	12	17	0.67	..
99.0	39	30	11.81	16	0.63	..
96.5	38	27.9	11	15.9	0.62	$\frac{20}{32}$
95	37.40	25.4	10	15	0.59	..
93.9	37	25	9.84	14.3	0.56	$\frac{18}{32}$
91.4	36	22.9	9	14	0.55	..
90	35.43	20.3	8	13	0.51	..
88.9	35	20	7.87	12.7	0.50	$\frac{16}{32}$
86.4	34	17.8	7	12	0.47	..
85	33.46	15.2	6	11.1	0.44	$\frac{14}{32}$
83.8	33	15	5.91	11	0.43	..
81.3	32	12.7	5	10	0.39	..
80	31.50	10.2	4	9.5	0.37	$\frac{12}{32}$
78.7	31	10	3.94	9	0.35	..
76.2	30	9	3.54	8.7	0.34	$\frac{11}{32}$
75	29.53	8	3.15	8	0.31	..
73.6	29	7.6	3	7.9	0.31	$\frac{10}{32}$
71.1	28	7	2.76	7.1	0.28	$\frac{9}{32}$
70	27.56	6	2.36	7	0.28	..
68.6	27	5.1	2	6.4	0.25	$\frac{8}{32}$
66.0	26	5	1.97	6	0.24	..
65	25.59	4	1.57	5.6	0.22	$\frac{7}{32}$
63.5	25	3	1.18	5	0.20	..
61.0	24	2.54	1	4.8	0.19	$\frac{6}{32}$
60	23.62	2	0.78	4	0.16	..
58.4	23	1	0.39	3.2	0.13	$\frac{4}{32}$
55.9	22			3	0.12	..
				2.4	0.09	$\frac{3}{32}$
				2	0.08	..
				1.6	0.06	$\frac{2}{32}$
				1	0.04	..
				0.8	0.03	$\frac{1}{32}$
				0.1	0.0039	..

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NOTE.—In all Latin titles and Latin botanical plant names of more than one syllable the accented syllable is distinguished by the sign ' placed after the corresponding vowel. The figures denote the pages.

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